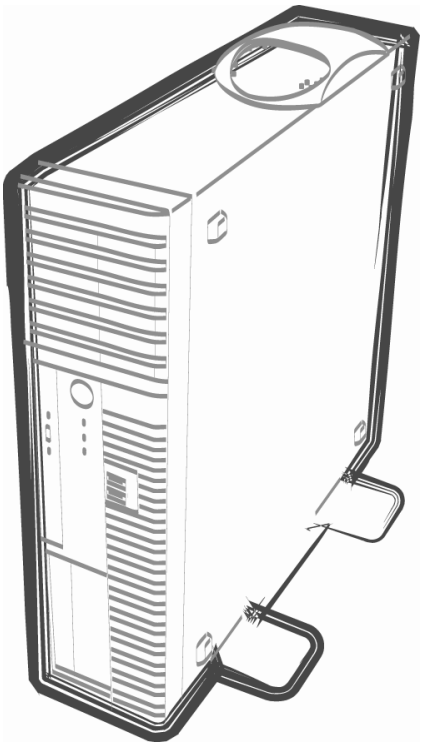
Express5800

NEC



NEC Express Server
Express5800 Series

Express5800/GT110e-S
EXP281A
Maintenance Guide

Model Number: N8100-1891F/1892F/1894F

Chapter 1 Maintenance

Chapter 2 Convenient Features

Chapter 3 Appendix

10.020.04-104.01
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Documents Provided with This Product

Documents for this product are provided as accompanying booklets (📖) and as electronic manuals (PDF) stored within the EXPRESSBUILDER DVD (💿).

📖 Precautions for Use	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**
📖 Getting Started	Describes how to use this server, from unpacking to operations. Refer to this guide as you begin for an overview of this server.

💿 EXPRESSBUILDER

PDF User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server's parts
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and ideal location for this server
Chapter 3: Setting Up Your Server	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications and other information

PDF Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and important information for installation
Chapter 2: Installing the Bundled Software	Installation of bundled software, such as NEC ESMPRO and Universal RAID Utility

PDF Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Convenient Features	Useful features and the detail of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs

PDF Other documents

Provides the detail of NEC ESMPRO, Universal RAID Utility, and the other features.

Contents

Documents Provided with This Product 2

Contents 3

Notations Used in This Document 6
- Notations used in the text 6
- Optical disk drives 6
- Hard Disk Drives 6
- Removable media 6
- Abbreviations of Operating Systems (Windows) 7

Trademarks 8

Regulatory Notices 9

Warnings and Additions to This Document 11
- Latest editions 11

Chapter 1 Maintenance 12

1. Transfer, Movement, and Disposal 13
   - 1.1 Transfer to a Third Party 13
   - 1.2 Disposal of the Server and Consumables 14
   - 1.3 Regarding the Transportation of This Server 14
   - 1.4 Moving and Storage 14

2. Daily Maintenance 16
   - 2.1 Checking and Applying Updates 16
   - 2.2 Checking Alerts 16
   - 2.3 Status Indicator LEDs 17
   - 2.4 Backup 17
   - 2.5 Cleaning 17
     - 2.5.1 Cleaning the server 18
     - 2.5.2 Cleaning the tape drive 18
     - 2.5.3 Cleaning the keyboard and mouse 18

3. User Support 19
   - 3.1 Maintenance Services 19
   - 3.2 Before Asking for Repair 19

4. Collecting Failure Information 20
   - 4.1 Collecting Event Logs 20
     - 4.1.1 Windows Server 2008 R2 / Windows Server 2008 20
     - 4.1.2 Windows Server 2003 R2 x64 Edition / Windows Server 2003 20
   - 4.2 Collecting Configuration Information 21
   - 4.3 Collecting User-Mode Process Dump (Dr. Watson Diagnostic Information) 21
   - 4.4 Collecting Memory Dump 21

5. Troubleshooting 22
   - 5.1 Upon Power On to the End of POST 22
   - 5.2 Upon Starting EXPRESSBUILDER 24
   - 5.3 Upon Installing OS 26
   - 5.4 When OS is Started 29
   - 5.5 When STOP Error Occurs 31
   - 5.6 When Operating a RAID System 32
   - 5.7 When Using Internal Devices and Other Hardware 35
   - 5.8 When OS is in Operation 36
   - 5.9 When EXPRESSBUILDER is Started on Windows 37

5.10 For Bundled Software 37
5.11 For Optical Disk Drives 38
5.12 When Power off 39

6. Windows System Recovery 40
6.1 Recovery of Windows Server 2008 R2 and Windows Server 2008 40
6.2 Recovery of Windows Server 2003 R2 x64 Edition and Windows Server 2003 40

7. Resetting and Clearing the Server 41
7.1 Software Reset 41
7.2 BMC RESET 41
7.3 Forced Shutdown 41
7.4 Clearing BIOS Settings (CMOS Memory) 42

8. System Diagnostics 45
8.1 Test Items 45
8.2 Startup and Exit of System Diagnostics 45

9. Offline Tools 48
9.1 Starting Offline Tools 48
9.2 Functions of Offline Tools 49
9.3 Console-less 50
9.3.1 How to remotely control 50
9.3.2 Preparation 50

Chapter 2 Convenient Features 51

1. System BIOS 52
1.1 Starting SETUP 52
1.2 Parameter Descriptions 52
1.2.1 Main 52
1.2.2 Advanced 54
1.2.3 Security 67
1.2.4 Server 72
1.2.5 Boot 76
1.2.6 Save & Exit 78

2. Flash FDD 79
2.1 Precautions 79
2.1.1 Compensation for recorded data 79
2.1.2 Handling the Flash FDD 79
2.1.3 Precautions when using EXPRESSBUILDER 80

3. Power Control Feature 81
3.1 Supported OS 81
3.2 Notes on Using Windows Server 2008 81

4. RAID System Configuration 82
4.1 Running the LSI Software RAID Configuration Utility 82
4.1.1 Exiting the LSI Software RAID Configuration Utility 83
4.2 Menu Tree 84
4.3 LSI Software RAID Configuration Utility Operating Procedure 86
4.3.1 Creating and adding a configuration 86
4.3.2 Executing rebuilding manually 91
4.3.3 Setting a hot spare Hard Disk Drive 92
4.3.4 Executing a Consistency Check 94
4.3.5 Other functions 95
4.4 LSI Software RAID Configuration Utility and Universal RAID Utility 96
4.5 WebBIOS and Universal RAID Utility 98
4.6 SuperBuild Utility and Universal RAID Utility 100

5. Details of EXPRESSBUILDER 101
5.1 Storage Media 101
5.2 Menu 102
5.3 Utilities Provided by EXPRESSBUILDER 105
5.4 Configure EXPRESSBUILDER Settings 106

6. EXPRESSSCOPE Engine 3 107

7. NEC ESMPRO 108
7.1 NEC ESMPRO Agent (for Windows) 108
7.2 NEC ESMPRO Manager 109
7.3 NEC ESMPRO Agent Extension 110
7.4 BMC Configuration 110
7.5 NEC ExpressUpdate Agent 110

8. NEC Product Info Collection Utility 111
8.1 Usage 111

9. Universal RAID Utility 112
9.1 Easy Configuration Function 112
9.2 Creating Logical Drive of RAID 6 112

Chapter 3 Appendix 113

1. POST Error Message 114

2. List of Windows Event Logs 124

3. Accessing Data for Electric Power, Temperature, and Processor Utilization 132
3.1 Windows 132
3.1.1 Power consumption 132
3.1.2 Intake air temperature 133
3.1.3 Processor utilization 136
3.2 Linux 137
3.2.1 Power consumption 137
3.2.2 Intake air temperature 138
3.2.3 Processor utilization 138

Notations Used in This Document

Notations used in the text

In addition to safety-related symbols urging caution, 3 other types of notations are used in this document. These notations have the following meanings.

Important	Indicates critical items that must be followed when handling the hardware or operating software. If the procedures described are not followed, **hardware failure, data loss, and other serious malfunctions could occur**.
Note	Indicates items that must be confirmed when handling the hardware or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drives

This server is equipped with one of the following drives, depending on the order at the time of purchase. These drives are referred to as *optical disk drives* in this document.

- **DVD-ROM drive**
- **DVD Super MULTI drive**

Hard Disk Drives

Unless otherwise stated, Hard Disk Drives (HDD) described in this document refer to the following.

- **Hard disk drives (HDD)**
- **Solid state drive (SSD)**

Removable media

Unless otherwise stated, removable media described in this document refer to the following.

- **USB memory**
- **Flash FDD**

Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.

Refer to *Chapter 1* (*1.2 Supported Windows OS)* in *Installation Guide (Windows)* for detailed information.

Notations in this document	Official names of Windows
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise
	Windows Server 2008 R2 Foundation
Windows Server 2008 *1	Windows Server 2008 Standard
	Windows Server 2008 Enterprise
Windows Server 2003 R2 x64 Edition	Windows Server 2003 R2 Standard x64 Edition
	Windows Server 2003 R2 Enterprise x64 Edition
Windows Server 2003 R2 *2	Windows Server 2003 R2 Standard
	Windows Server 2003 R2 Enterprise
Windows Server 2003 *2	Windows Server 2003 Standard
	Windows Server 2003 Enterprise
Windows 7	Windows 7 Professional 64-bit(x64) Edition
	Windows 7 Professional 32-bit(x86) Edition
Windows Vista	Windows Vista Business 64-bit(x64) Edition
	Windows Vista Business 32-bit(x86) Edition
Windows XP	Windows XP Professional x64 Edition
	Windows XP Professional
Windows PE *3	Windows Preinstallation Environment

*1: Includes 64-bit and 32-bit Editions unless otherwise stated.
The following appears on EXPRESSBUILDER.

- Windows Server 2008 64-bit Edition: Windows Server 2008 x64
- Windows Server 2008 32-bit Edition: Windows Server 2008 x86

*2: Unless otherwise stated, Windows Server 2003 R2 and Windows Server 2003 are collectively referred to as Windows Server 2003.

*3: Used as an installation platform only.

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Industry Canada Class A Emission Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CE / Australia and New Zealand Statement

This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

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這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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EU-wide legislation as implemented in each Member State requires that used electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes Information and Communication Technology (ICT) equipment or electrical accessories, such as cables or DVDs.

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Turkish RoHS information relevant for Turkish market

EEE Yönetmeliğine Uygundur

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声　明

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部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板	×	○	○	○	○	○
HDD、DVD等	×	○	○	○	○	○
机箱、支架	○	○	○	○	○	○
电源	×	○	○	○	○	○
键盘	×	○	○	○	○	○
其他（电缆、鼠标等）	×	○	○	○	○	○

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Keep this document nearby so that you may refer to it as necessary.

Latest editions

This document was created based on the information available at the time of its creation. The screen images, messages and procedures **may differ from the actual screens, messages and procedures.** Substitute as appropriate when content has been modified.

The most recent version of User's Guide, as well as other related documents, is also available for download from the following website.

http://www.nec.com/

NEC Express5800 Series
Express5800/GT110e-S

1 Maintenance

This chapter explains inspection and maintenance procedures, and what actions are to be taken in case of trouble when operating this server.

1. **Transfer, Movement, and Disposal**
   Describes how to transfer and move this server to a third party. Also describes how to dispose and store this server.

2. **Daily Maintenance**
   Describes what you must confirm for daily use, how to manage files, and how to clean the server.

3. **User Support**
   Describes various services on this product. Services are offered from NEC and the maintenance service companies authorized by NEC.

4. **Collecting Failure Information**
   Describes how to collect information about the location where a failure occurred and its cause when the server malfunctions. Refer to this chapter in case of a failure.

5. **Troubleshooting**
   Describes how to identify the causes of problems and what actions are to be taken to address them. Refer to this chapter when you suspect a failure.

6. **Windows System Recovery**
   Describes Windows recovery setup. Refer to this chapter when the Windows is corrupt.

7. **Resetting and Clearing the Server**
   Describes how to reset or clear the server. Refer to this chapter when the server is not working or when you wish to restore the settings made in BIOS to the factory settings.

8. **System Diagnostics**
   Describes system diagnostics of this server and checking connection status check.

9. **Offline Tools**
   Describes tools for preventive maintenance of this product.

1. Transfer, Movement, and Disposal

1.1 Transfer to a Third Party

Observe the following precautions when you transfer (or sell) the server or software provided with the server to a third party.

- **Server**

  When transferring (or selling) the server to a third party, be sure to provide this manual (including electronic data) to the third party.

- **Data on the Hard Disk Drive**

  Be sure to erase Hard Disk Drive data to prevent the leakage of sensitive data (such as customer information or company management information) to any third parties. It is the user's responsibility to erase this data.

  Important **NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.**

  Data seems to be erased when you empty "Recycle Bin" of Windows or execute the "format" command of the operating system. However, the actual data remains on the Hard Disk Drive. Data not erased completely might be restored by special software and used for unexpected purposes.

- **Bundled software**

  Observe the following precautions when transferring (selling) the provided software to a third party.

  – Transfer them with the server.
  – All provided media and documents must be transferred and no backup copies must be retained.
  – Transfer requirements listed in "Software License Agreement" that comes with each software application must be satisfied.
  – Software on client PC must be uninstalled before transferring.

1.2 Disposal of the Server and Consumables

- Dispose of the server, Hard Disk Drives, DVD/CD-ROMs, option board, and battery according to laws and regulations of the central and/or local government. Also dispose of the power cord attached to this product together with the server to prevent diversion to other products.

Note

- For disposal (or replacement) of the battery on the mother board of the server, consult with your sales representative.
- It is the user's responsibility to completely erase all data stored on storage devices such as Hard Disk Drives, backup data cartridges, or any other media (such as CD-R/CD-RW) so that the data cannot be restored by a third party.

- Some components including fans, built-in batteries, and the optical disk drive work for a limited period of time and require replacement. For stable operation of the server, NEC recommends you regularly replace these components. Contact the store where you purchased the server or a maintenance service company for information on replacement or the lifetime of components.

1.3 Regarding the Transportation of This Server

This server and/or some of the associated optional devices uses lithium metal batteries or lithium ion batteries. **Regulations for air/ocean transportation apply when transporting lithium batteries.** Conform to theregulations if you want to transport this server or optional devices by air or ship.

1.4 Moving and Storage

Follow the steps below when you move or store this server.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **Do not disassemble, repair, or alter the server.**
- **Do not remove the lithium, NiMH, or Li-ion batteries.**
- **Disconnect the power plug before installing or removing the server.**

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **Do not lift the server by its front bezel or air duct.**
- **Make sure to complete installation.**
- **Do not get your fingers caught.**
- **Be careful of handling internal components that may be at high temperatures.**

Note

- If the server has a built-in Hard Disk Drive, move the server while being careful not to damage the drive.
- When storing the server, monitor the environmental conditions of the storage area (temperature: –10°C to 55°C, humidity: 20% to 80%). (No dew condensation is permitted)

Tips

Make backup copies of important data stored in the Hard Disk Drive.

1. Remove the media from the optical disk drive
2. Power off the server (POWER LED goes off)
3. Unplug the power cord of the server from the power outlet.
4. Disconnect all the cables from the server
5. Pack the server securely to protect from damage, shock, and vibration.

Important

If this server and internal optional devices are suddenly moved from a cold place to a warm place, condensation will occur and cause malfunctions and failures when these are used in such state. Wait for a sufficient period of time before using the server and other components in the operating environment.

Note

- Check and adjust the system clock before operating after relocating or storing the server.
- If the system clock time is significantly delayed or advanced over time in spite of adjustment, contact your sales representative.

2. Daily Maintenance

To use this server under top conditions at all times, periodically check and perform maintenance as follows. If abnormalities are found, ask your sales representative, avoiding impossible operation.

2.1 Checking and Applying Updates

Express5800 Series posts update information for BIOS, FW (firmware), driver, and others of the server and peripheral devices on our website. We recommend that the latest update always be applied for stable system.

NEC corporate site: **http://www.nec.com/**

[Support & Downloads]

NEC also provides the tool *ExpressUpdate* that supports the detection, download, and application of the updates that must be applied to BIOS and FW (firmware) of the server.

ExpressUpdate is contained in EXPRESSBUILDER provided with the server.

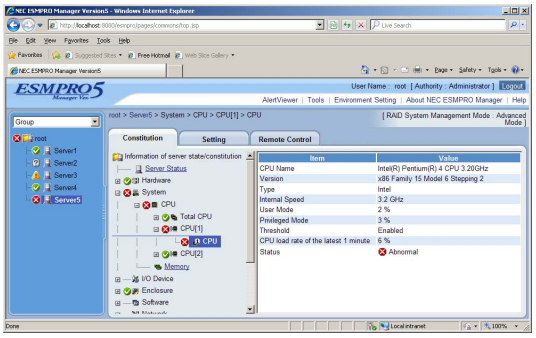
Tips

- Download and apply the latest update yourself.
- NEC recommends that you back up data for a rainy day before applying the latest update.

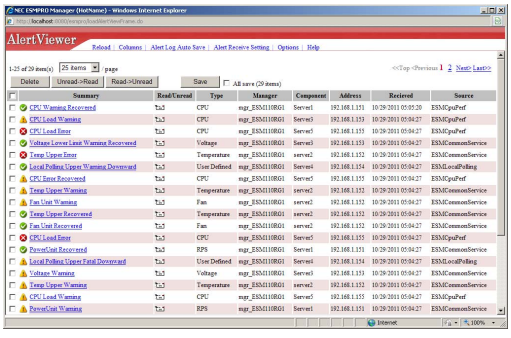
2.2 Checking Alerts

Use NEC ESMPRO Manager (for Windows) to constantly verify that no abnormalities are discovered on the monitored server and that no alerts have been issued.

Example image of NEC ESMPRO Manager



NEC ESMPRO Manager



AlertViewer

2.3 Status Indicator LEDs

After powering on the server or before shutting down the system and powering off the server, check the status indicator LEDs on the front of the server. For the functions and descriptions of LEDs, refer to *Chapter 1 (5. Names and Functions of Parts)* in "*User's Guide*". If the indicator shows the server abnormality, contact your salses representative.

2.4 Backup

We recommend that you periodically back up the data on HDD.

If RAID System has been setup on your system, back up RAID Configuration Data. We also recommend that you back up it after a rebuilt required due to HDD failure. For information on RAID Configuration Data backup, refer to the utility offered by EXPRESSBUILDER in *Chapter 2 (5. Details of EXPRESSBUILDER)*.

2.5 Cleaning

Regularly clean the server to keep it in good condition.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **Do not disassemble, repair, or alter the server.**
- **Disconnect the power plug before cleaning the server.**

2.5.1 Cleaning the server

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces.

Important

- **Do not use volatile solvents such as thinner and benzene to clean the server. Those solvents could damage or tarnish the material.**
- **The power outlet, cables, connectors on the server, and the inside of the server must be kept dry.**

1. Confirm that the power is OFF (POWER LED is OFF)
2. Unplug the power cord of the server from a power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server with the cloth prepared in Step 4.
6. Soak a soft cloth in water, squeeze it firmly, and wipe the server with it once again.
7. Wipe the server with a dry cloth.

2.5.2 Cleaning the tape drive

A dirty tape drive head causes unsuccessful file backup and damages the tape cartridge. Periodically clean the tape drive with the designated cleaning tape.

For the cleaning interval and method, the estimated usable period and lifetime of the tape cartridge, refer to the manual attached to the tape drive.

2.5.3 Cleaning the keyboard and mouse

Wipe the surface of the keyboard with a dry cloth after confirming that the whole system, including the server and the peripherals, are shut down and the POWER LED is off.

An optical mouse does not work properly if the lens area is not clean. Wipe the sensor with a dry cloth to remove any dirt or dust.

3. User Support

Before getting after-sales service, check the contents of the warranty and service.

3.1 Maintenance Services

Service representatives from NEC subsidiary companies or companies authorized by NEC provide maintenance services. For the services, contact your sales representative.

3.2 Before Asking for Repair

If you think that a failure occurred, follow the steps below:

1. Check if the power cord and cables to other products are properly connected.
2. Refer to *Chapter 1 (5. Troubleshooting)*. If you find a symptom similar to your problem, take the action as instructed.
3. Confirm that the required software has been properly installed.
4. Scan for viruses using a commercial Antivirus Software.

If the problem persists after taking the measures above, contact your sales representative. Take notes on LED indications and the display on the screen at the failure, which will be useful information for the repair.

For repair within the warranty period, be sure to apply with your warranty.

4. Collecting Failure Information

If the server is broken, you can collect failure information by using the following method.
The failure information to be described is to be collected only at the request of your sales representative.

Important **When the system restarts after a failure has occurred, a message may appear indicating virtual memory shortage. Ignore this message and proceed with starting the system. Restarting the system may result in an inability to properly dump the data.**

4.1 Collecting Event Logs

Collection for various event logs that occurred on the server follows the steps below.

Tips If a STOP error, system error, or stall occurs, restart the system and then follow the steps below.

4.1.1 Windows Server 2008 R2 / Windows Server 2008

1. Select **Administrative Tool** and then **Event Viewer** from **Control Panel**.
2. Select the type of log in **Windows Logs**.

   Application records events related to running applications.

   Security records events related to security.

   System records events that occur in Windows system components.
3. Select **Save All Event As...** from **Action** menu.
4. Enter the file name of the archived log in **File name**.
5. Select the type of the log file you want to save in **Save as type**, and then click [Save].

4.1.2 Windows Server 2003 R2 x64 Edition / Windows Server 2003

1. Select **Administrative Tool** and then **Event Viewer** from **Control Panel**.
2. Select the type of log to collect.

   Application records events related to running applications.

   Security records events related to security.

   System records events that occur in Windows system components.
3. Select **Save All Event As...** from **Action** menu.
4. Enter the file name of the archived log in **File name**.
5. Select the type of the log file you want to save in **Save as type**, and then click [Save].

For more information, refer to Windows Online help.

4.2 Collecting Configuration Information

This section describes how to collect information on hardware configuration and internal specifications.

Tips If a STOP error, system error, or stall occurs, restart the system and then follow the procedure below.

1. Select **Run** from **Start** menu.
2. Enter `msinfo32.exe` in **Open** text box, and then click [OK].
3. **System Information** starts.
4. From **Files** menu, click **Export**.
5. Enter the file name to save in **File Name**, and then Click [Save].

4.3 Collecting User-Mode Process Dump (Dr. Watson Diagnostic Information)

Dr. Watson collects diagnostic information related to application errors.

For details, refer to *Chapter 1 (7.2 How to Create a User-Mode Process Dump File)* in "*Installation Guide (Windows)*".

4.4 Collecting Memory Dump

If an error occurs, the dump file should be saved to acquire necessary information. You can specify any location for saving the diagnostic information. For details, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".

Consult with your sales representative before dumping the memory. Dumping the memory while the server is in operating normally may affect the system operation.

Important **A message indicating insufficient virtual memory may appear when restarting the system due to an error. Ignore this message and proceed. Restarting the system may result in an inability to properly dump the data.**

5. Troubleshooting

If this system does not operate as intended, check it according to the contents of the following checklist before sending it for repair. If an item in the checklist corresponds with a problem you are experiencing, follow the subsequent check and processing instructions.

If the system still does not operate normally, write down the messages displayed on the screen and then contact the maintenance service company.

5.1 Upon Power On to the End of POST

[?] **When the power cable is connected, the POWER LED turns on.**

→ The POWER LED lights amber during initialization of the server after connecting the power cord. The POWER LED turns off when initialization finishes. This is a normal operation, not a malfunction.

[?] **When the power cable is connected, the POWER LED turns on.**

→ Although the POWER LED turns on immediately after AC power is supplied, no error has occurred. The POWER LED turns off when the POWER switch is turned ON/OFF.

[?] **Fail to power on the server**

☐ Is the server properly supplied with power?

→ Check if the power cord connects to the power outlet (or UPS) that meets the power specifications for the server.

→ Use the power cord that comes with the server. Additionally, check the power cord for broken shield or bent plugs.

→ Make sure the power breaker for the connected power outlet is on.

→ If the power cord is plugged to a UPS, make sure the UPS is powered and it outputs power. Refer to the manual that comes with the UPS for details.
Power supply to the server may be linked with UPS using the BIOS Setup utility.

☐ Did you press the POWER switch?

→ Press the POWER switch on the front of the server to turn on the power (the POWER LED ON).

→ When the power cord is connected, the management controller is initialized. The power cannot be turned on during initialization, even if the POWER switch is pressed. The POWER LED lights amber during initialization. Press the POWER switch after the POWER LED turns off.

☐ Is Standby Power Save set to **Enable** in the BIOS setup?

→ When Standby Power Save is enabled, remote power on is not allowed, and you can power on the server only by using the power switch on the server. If you change the AC Link setting while Standby Power Save is enabled, you need to press the power switch twice to start up the server.

[?] **POST does not complete**

☐ Is memory installed correctly?

→ You must install at least 1 DIMM for the server to operate.

☐ Is the memory size large?

→ The memory check may take longer than usual if the installed memory size is large. Wait for a while.

☐ Did you perform any keyboard or mouse operation immediately after you started the server?

→ If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops processing. In such a case, reboot the server. Do not perform any keyboard or mouse operation until the BIOS start-up message appears after you reboot the server.

☐ Are memory and PCI devices supported for use with this server?

→ Operation of the server with unauthorized devices is not guaranteed.

5.2 Upon Starting EXPRESSBUILDER

[?] **Unable to start EXPRESSBUILDER**

☐ Did you insert the EXPRESSBUILDER DVD and reboot while POST was being executed?

→ The server tries to read CD/DVD upon completion of POST. If EXPRESSBUILDER is not set at this timing, an error message may appar or the OS starts up. Restart the server and retry.

☐ Are BIOS settings correct?

→ The BIOS setup utility allows you to configure the boot order of the boot devices. Configure the boot order so that the optical disk drive will be the first to start up.
(Check menu: **Boot**)

☐ Is a message such as the following displayed?

→ Take an appropriate action according to the table below.

Message	Cause
`This EXPRESSBUILDER version is not designed for this computer.` `Insert the correct version and click [OK].`	Execute the NEC EXPRESSBUILDER provided with the server.
`EXPRESSBUILDER could not get the hardware parameters of this motherboard.` `This version is not designed for this computer or the motherboard may be broken.`	Contact your sales representative.
`The file that EXPRESSBUILDER tried to operate was not found.`	EXPRESSBUILDER cannot be read. Media may be defective or the optical disk drive may be faulty. Contact the maintenance service company.
`The file that EXPRESSBUILDER tried to operate was not able to open.`	
`EXPRESSBUILDER can not get the parameters of the definition file.`	
`An undefined error occurred.`	Contact your sales representative.

[?] **Unable to start EXPRESSBUILDER from the Internal Flash Memory**

☐ Did you press the <F3> key to start EXPRESSBUILDER from the Internal Flash Memory while POST was being executed?

→ When the following message, "Press <F2> Setup, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network", appears on screen after starting up, press <F3> to start EXPRESSBUILDER from the Internal Flash Memory.

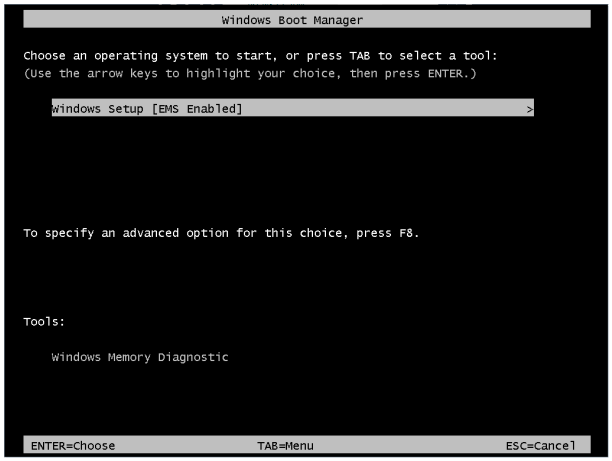
☐ Is there a message, "<F3> Internal Flash Memory", displayed on the POST screen?

→ If not, make sure that the Internal Flash Memory is connected correctly by referring *Chapter 2 (5. Details of EXPRESSBUILDER)*.

☐ Did you purchase the Internal Flash Memory as BTO?

→ If not, copy EXPRESSBUILDER to the Internal Flash Memory first by referring to *Chapter 2 (5. Details of EXPRESSBUILDER).*

[?] **The following message appears and EXPRESSBUILDER failed to start.**


Windows Boot Manager
Choose an operating system to start, or press TAB to select a tool:
(Use the arrow keys to highlight your choice, then press ENTER.)
Windows Setup [EMS Enabled]
To specify an advanced option for this choice, press F8.
Tools:
Windows Memory Diagnostic
ENTER=Choose
TAB=Menu
ESC=Cancel

☐ Did you press <Enter> key consecutively twice or more when selecting "Os installation *** default ***" ?

→ Press <Enter> key on the above screen for selecting "Windows Setup [EMS Enabled]" to start EXPRESSBUILDER.

5.3 Upon Installing OS

[?] **Unable to install OS**

☐ Did you configure the RAID Controller?

→ For the RAID System, use EXPRESSBUILDER or a RAID Configuration Utility (LSI Software RAID Configuration Utility, WebBIOS, or SuperBuild Utility) to properly configure the RAID Controller before installing OS.

☐ Did you create a Logical Drive?

→ For the RAID System, create a Logical Drive using EXPRESSBUILDER, LSI Software RAID Configuration Utility, WebBIOS, or SuperBuild Utility to install OS.

[?] **Unable to install Windows**

☐ Have you checked precautions for installation?

→ For Windows Server 2003, refer to "*Installation Guide (Windows)*".

[?] **While installing OS on Windows Server 2003 x64 Edition or Windows Server 2003, a driver list of the OEM drivers is not displayed**

☐ Did you change the boot priority in the Flash FDD?

→ Start the BIOS setup utility, and change the boot priority in the Flash FDD as follows.

Boot - **Floppy Drive BBS priorities** - **Boot Option #1** - **Flash FDD**

[?] **A product key was not requested**

☐ For Windows Server 2008 R2/Windows Server 2008

→ If you install using the backup DVD-ROM, entering the product key is not required. If installing using a DVD-ROM other than the backup DVD-ROM, a screen for entering the product key is displayed twice, during OS installation, and, before the MICROSOFT SOFTWARE LICENSE TERMS dialog box, which displays after OS installation. Follow the on-screen instructions to enter the product key.

[?] **The following devices are indicated as faulty devices in a Windows Server 2008 R2 ServerCore installation environment**

- SM Bus Controller
- PCI Simple Communications Controller
- Base System Device
- System Interrupt Controller
- Performance Controller

→ There is no operational problem.

[?] **Unable to access the partition which was previously created after reinstalling while several disks are connected**

→ For details, refer to the Microsoft website below:

http://support.microsoft.com/kb/2497048/ja (Japanese only)

[?] **When Windows Server 2008 R2 is installed while several disks are connected, the system partition and the boot partition (100 MB) are sometimes created in another disk**

→ For details, refer to the Microsoft website below:

http://support.microsoft.com/kb/2530901/ja (Japanese only)

[?] **When Starter Pack is executed on Windows Server 2008 R2, the below message is sometimes displayed for a moment upon shutdown**

```
1 program still needs to close:
(Waiting for) Task Host Window
```

→ No problems for system operation.

For details, refer to the Microsoft website below:

http://support.microsoft.com/kb/975777/en-us

[?] **Windows Server 2003 R2 DISC 2 was installed after the Windows Server 2003 Service Pack had been applied**

→ Reapply the Service Pack. If you applied the Service Pack even once after installing Windows Server 2003 R2 DISC 2, you need not reapply it.

* If the Service Pack application is unknown when you install Windows Server 2003 R2 DISC 2, NEC recommends that the Service Pack be reapplied.

[?] **The message "PCI Express Correctable" is registered in the DMI event log when installing Windows.**

→ This message may be registered when installing Windows. There is no operational problem.

[?] **The system was installed as Workgroup although it is set to join the domain**

☐ Is the LAN cable properly connected?

→ If the LAN cable is not connected, the system is installed in workgroup setting, not in domain join setting. After the OS is started, join the domain.

[?] **The following functions are installed when Windows Server 2008 R2 or Windows Server 2008 was set up using EXPRESSBUILDER and when IISis installed.**

☐ Windows Process Activation Service

- Process Model
- Configuration APIs

☐ Remote Server Administration Tool

- Role Administration Tools
- Web Server (IIS) Tools

→ The features listed above are activated because they are required for the installation of IIS basic features.

[?] **The Telnet Service is not installed**

→ Adjust the computer name to 14 characters or less, and then install the Telnet Service according to the following procedure:

How to install the Telnet Service

(1) Click **Run** on **Start** menu.

(2) Enter `tlntsvr/service` in the **Open** box, and then click [OK].

(3) Click **Start** menu, point to **Control Panel,** click **Administrative Tools**, and then click **Services** to confirm whether the Telnet Service is registered.

* When the installation of Telnet Service is finished, there is no problem if the computer name is set to 15 characters or more.

[?] **Fails to execute "Create a parameter file for Windows OS"**

→ **"Create a parameter file for Windows OS"** must be run using Microsoft® HTML Application host. If it does not start, associate the file type with Microsoft® HTML Application host via the following process.

(1) Select **Run** in **Windows Start** menu.

(2) Enter `%windir%\system32\mshta.exe/register`.

5.4 When OS is Started

[?] **It takes too long to start the OS or the OS does not start up**

☐ Is the ROM on the PCI board or the network boot (PXE boot) enabled?

→ For a SCSI controller, if no Hard Disk Drive on which an OS is installed is connected, set the ROM for that slot to **Disabled**. When you do not perform the network boot from the network interface card (NIC), memory consumption and start-up time can be reduced by disabling ROM on NIC.
Menu to be checked: **Advanced** → **PCI Configuration** → submenu for each controller

If no Hard Disk Drive on which an OS is installed is connected, set the ROM for that slot to **Disabled**.

[?] **Unable to start OS**

☐ Has the BIOS configuration of the RAID Controller changed?

→ Set the correct BIOS configuration with a RAID Configuration Utility (LSI Software RAID Configuration Utility or WebBIOS).

☐ Is the RAID Controller recognized by POST?

→ Turn on the power after the RAID Controller is recognized as being connected successfully.

→ If the RAID Controller is not recognized as being connected successfully, the RAID Controller may be faulty. Contact the maintenance service company with which you signed up or the dealer where you purchased the product.

☐ Is RAID Controller inserted firmly straight into the PCI slot?

→ Install the RAID Controller properly.

☐ Is the RAID Controller mounted on the PCI slot for which the mounting is restricted?

→ Check the mounting restrictions of the server and then mount the RAID Controller on the correct slot.
If the RAID Controller is not recognized as connected although the above action has been taken, the RAID Controller may be faulty. Contact the maintenance service company with which you signed up or the dealer where you purchased the product.

☐ Are Hard Disk Drives properly installed?

→ Install the RAID Controller properly.

☐ Is SAS cable connected to Hard Disk Drive correctly? (check connections with Hard Disk Drives)

→ Connect the SAS cable properly.
If the SAS cable is not recognized as connected although the above action has been taken, the Hard Disk Drive may be faulty. Contact the maintenance company with which you signed up or the dealer where you purchased the product.

☐ Is the EXPRESSBUILDER DVD inserted?

→ Eject the EXPRESSBUILDER DVD and reboot.

☐ Is the OS corrupt?

→ Refer to *Chapter 1 (6. Windows System Recovery)* to recover the OS.

[?] **OS does not start with the /3GB switch**

→ In Windows Server 2003 x86, System may fail to start the OS with the /3GB switch.
In this case, please adjust the capacity of the user mode area using the /userva switch in reference to the following URL.
http://support.microsoft.com/kb/316739/en-us

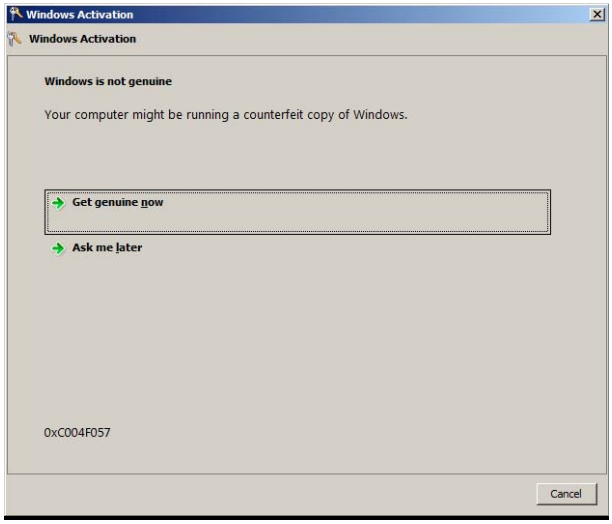
[?] **The system displays the message below and fails to log on:**

```
Windows Product Activation

This copy of Windows must be activated with
Microsoft before you can continue.
You cannot log on until you activate Windows.

To shut down the computer, click [Cancel].

        Yes (Y)  No (N)  Cancel
```

☐ Is the Windows product license authentication procedure completed?

→ In Windows Server 2003, the above message will be displayed if you use the operating system without executing the license authentication. Select [Yes], and execute the procedure for license authentication.

[?] **The following message appears when logging in the system on Windows Server 2008 R2 or Windows Server 2008:**



☐ Have you finished license authentication for Windows product?

→ The above message will appear if you use Windows Server 2008 R2 or Windows Server 2008 with the unauthenticated license.
Select [Get Genuine now] and proceed license authentication.
The above message is an example of request for license authentication. The message displayed on screen may differ from this depending on the license.

5.5 When STOP Error Occurs

[?] **Cannot turn the power OFF at the blue screen (STOP error screen)**

→ If you want to turn off the power at the blue screen, execute forced shutdown (continue to press the POWER switch for 4 seconds). If you press the switch briefly instead of holding it, the server will not power off.

5.6 When Operating a RAID System

[?] **Unable to rebuild Hard Disk Drive**

☐ Is the capacity of the Hard Disk Drive to be rebuilt enough?

→ Use a Hard Disk Drive with the same capacity as that of the faulty Hard Disk Drive.

☐ Is the Logical Drive RAID0?

→ RAID0 cannot be rebuilt because it has no redundancy. Replace the failed Hard Disk Drive, recreate the configuration information, initialize it, and recover the drive using backup data.

[?] **Fails to automatically rebuild the Hard Disk Drive**

☐ Did you secure sufficient time for replacing the Hard Disk Drive?

→ To make auto-rebuild work, secure at least 90 seconds from when a Hard Disk Drive is removed to when the drive is installed.

☐ Are settings correct?

→ Use the LSI Software RAID Configuration Utility to check the Auto Rebuild settings.

TOPMENU → Objects → Adapter → Auto Rebuild

* The Auto Rebuild settings are not available in WebBIOS.

[?] **The Hard Disk Drive failed**

→ Contact the maintenance service company with which you signed up or the dealer where you purchased the product.

[?] **A part of Physical Device information of Universal RAID Utility is not be displayed correctly**

→ If LSI Embedded MegaRAID is used, a part of Physical Device information of Universal RAID Utility may not be displayed correctly.

[?] **Unable to perform Consistency Check**

☐ Is the Logical Drive **Critical** or **Degraded**?

→ Replace the failed Hard Disk Drive with new one, and then perform Rebuild.

☐ Is RAID0 configured for the Logical Drive?

RAID0 has no data redundancy, and therefore, Check Consistency is disabled in the RAID0 configuration.

[?] **Cannot set Write-Back for Cache Mode**

→ The current cache of RAID Controller is displayed on **Virtual Disks** – **Properties** – **Policies** – **Write.** If an extra battery is faulty, is not connected, or insufficiently charged, the Cache Mode is changed to **WThru (Write Through)** even if you specify **WBack (Write Back).**

For the description of the Cache Mode, refer to *Chapter 2 (4. RAID System Configuration)*.

[?] **The N8103-141 or N8103-153 extra battery is not recognized or the following message is displayed in POST**

```
The battery hardware is missing or malfunctioning, or the battery is unplugged, or the battery
could be fully discharged. If you continue to boot the system, the battery-backed cache will not
function.
If battery is connected and has been allowed to charge for 30 minutes and this message continues
to appear, then contact technical support for assistance.
Press 'D' to disable this warning (if your controller does not have a battery.
```

☐ Are the cable between the battery pack and battery board and the control cable between the battery board and battery connector connected correctly?

→ Connect the cables correctly.

☐ Is this message displayed after the battery is connected?

→ If the battery charging status is low, the battery may not be recognized. If the battery is not recognized although 24 hours has passed, restart the system once.

If the battery is not recognized although the above action has been taken, the extra battery may be faulty. Contact the maintenance service company with which you signed up or the dealer where you purchased the product.

[?] **Event ID129: The following message appears on Windows Event Log**

```
Event source  :  megasas2
Event ID      :  129
Type          :  Warning
Description   :  Reset to device, \Device\RaidPortX, was issued.
```

→ Retry by OS has succeeded. It is not the problem in operating the system.

Note A different number replaces X depending on the system.

[?] **Event ID505: If the N8103-141 or N8103-153 extra battery is mounted, the following message may be registered in the RAID log of Universal RAID Utility and OS logs (Windows event log, Linux syslog)**

```
Event source  :  raidsrv
Event ID      :  505
Type          :  Warning
Description   :  <RU0505> [CTRL: Number of RAID Controller] Temperature of battery is
                 high.
```

☐ If the above event is registered, check the Cache Mode (current value) of the RAID Controller with Universal RAID Utility.

→ If the Cache Mode (current value) is **Write Back**, use the battery as is because there is no problem.

→ If the Cache Mode (current value) is **Write Through**, the battery refresh operation causes the battery temperature to rise temporarily. This event temporarily stops the refresh operation, so the battery temperature drops and the refresh operation resumes. However, it may take time till the temperature drops. After the refresh operation is completed, the Cache Mode (current value) changes to **Write Back**. If the Cache Mode does not change to **Write Back** although 24 hours have elapsed, the battery may be faulty. Replace the battery.

[?] **Event ID508: If the N8103-141 or N8103-153 extra battery is mounted, the following message is registered in the RAID log of Universal RAID Utility and OS logs (Windows event log, Linux syslog)**

```
Event source  :  raidsrv
Event ID      :  508 (800001FC)
Type          :  Warning
Description   :  <RU0508> [CTRL: Number of RAID Controller] The battery status is
                 unstable.
```

☐ Did the battery become unstable immediately after the extra battery had been mounted?

→ Immediately after the extra battery is mounted, this event may be registered till the battery refresh operation is completed.

☐ If this message is registered, wait for about 15 minutes and check the Cache Mode (current value) of the RAID Controller. If the Cache Mode (current value) is **Write Back**, use the battery as is because there is no problem.

→ If the current cache mode is set to “Write Through”, the battery needs to be refreshed. Contact your service representative.

If “Write Through” is retained for 9 hours or more after starting refresh operation, the battery may be faulty. Replace the battery.

[?] **Event ID510: The following event is logged in RAID log of Universal RAID Utility and OS log (Windows event log or Linux syslog) when additionally battery is installed.**

```
Event source  :  raidsrv
Event ID      :  510
Type          :  Info
Description   :  <RU0510> [CTRL: Number of RAID Controller]
                 Battery Refresh required.
```

→ Use Universal RAID Utility to perform battery refresh manually. Refer to *Universal RAID Utility User's Guide* stored in EXPRESSBUILDER for more information.

[?] **DISK LED flashes**

☐ DISK LED flashes frequently even while the Hard Disk Drive is not accessed.

→ When Patrol Read is running, the DISK LED flashes even if the Hard Disk Drive is not being accessed. If SATA Hard Disk Drive is used, the DISK LED may stay on.

5.7 When Using Internal Devices and Other Hardware

[?] **Fail to access the internal or external devices (or such devices fail to operate)**

- ☐ Are cables properly connected?
  - → Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.
- ☐ Is the power-on order correct?
  - → When the server has any external devices connected, power on the external devices first, then the server.
- ☐ Did you install drivers for connected optional devices?
  - → Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.
- ☐ Is option board setting correct?
  - → Usually, no PCI device settings need to be changed. However, depending on the board to be set, special setting may be required. Refer to the manual that comes with the board for details to make correct settings.
  - → Some devices connected to the serial or parallel port, or USB port may require I/O port address or operation mode settings. Refer to the manual that comes with the device to make correct settings.

[?] **The keyboard or mouse does not work**

- ☐ Is the cable properly connected?
  - → Make sure that the cable is connected to the connector on the front or rear of the server.
- ☐ Is BIOS configuration correct?
  - → You can use the BIOS setup utility to change the keyboard feature. Check the BIOS configuration with this utility.
- ☐ Are the server drivers installed?
  - → Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to the manual to check that the keyboard and mouse settings are correct.

[?] **Unable to access the Hard Disk Drive**

- ☐ Is the Hard Disk Drive supported by the server?
  - → Operation of any device that is not authorized by NEC is not guaranteed.
- ☐ Is the Hard Disk Drive properly installed?
  - → Check the Hard Disk Drive installation status and the cable connections. Use the screws provided with the Hard Disk Drive to mount the Hard Disk Drive.

[?] **The Hard Disk Drive access LED lights up**

- → The Hard Disk Drive access LED lights up when the Hard Disk Drive is accessed. This green light does not indicate the disk failure.

5.8 When OS is in Operation

[?] **Windows operation is unstable**

☐ Have you installed the Starter Pack?

→ If the network driver is installed after OS is installed, Windows operation may become unstable.

Install the Starter Pack by referring to the description about how to install the Starter Pack for each OS in "*Installation Guide (Windows)*".

[?] **After the system is restored from the backup tool, Windows is misbehaving**

→ Use EXPRESSBUILDER to apply Starter Pack.

[?] **The system time lags**

→ In Windows Server 2008, If you do not use the server that adjusts time such as NTP (Network Time Protocol) Server, the system time may differ from actual time.

In this case, use NTP server or disable Windows Time Service.

[?] **Fails to be recognized on network**

☐ Is the cable connected properly?

→ Securely connect the proper cable to the network port on the rear of the server. Additionally, make sure that the cable conforms to the network interface standards.

☐ Are BIOS settings correct?

→ You can disable the internal network controller using the BIOS setup utility. Check the settings with BIOS setup utility.

☐ Have you completed protocol and services settings?

→ Verity that the network driver for the server network controller has been installed. Also verify that protocol such as TCP/IP or various services have been properly specified.

☐ Are transfer rate settings correct?

→ Verify that the transfer rate and duplex mode are the same as those of the connecting hubs.

[?] **There are RX dropped packets (ifInDiscards) when the system is in operation on Linux and Windows**

→ Although there may be RX dropped packets when the LAN is received multicast frames, there is no operational problem.

5.9 When EXPRESSBUILDER is Started on Windows

[?] **Cannot read online documents**

☐ Do you have Adobe Reader installed correctly in your system?

→ Some documents are supplied in PDF format. To read PDF files, Adobe Reader needs to be installed in your computer.

☐ Is your browser Internet Explorer?

→ Internet Explorer sometimes displays the Information bar to enforce security. If this happens, click the Information bar to display the documents.

[?] **The menu does not appear**

☐ Is the operating system Windows XP or later, or Windows Server 2003 or later?

→ Operate this program with Windows XP or later, or Windows Server 2003 or later.

→ Windows Server 2008 Server Core is not supported.

☐ Is the shift key pressed?

→ Setting the DVD/CD with the shift key pressed down cancels the Autorun feature.

☐ Is the OS in the proper state?

→ The menu may not appear depending on the system registry setting or the timing to set the DVD/CD. In such a case, select **My Computer** from Explorer and double-click the icon of the set DVD drive.

[?] **The menu items started by Autorun are unavailable**

☐ Is your system environment correct?

→ Some software requires administrator authority or needs to be operated on the server. Run on the appropriate environment.

→ Confirm the settings of [Regional and Language Options]. Set the language settings of each tab to English (US).

5.10 For Bundled Software

[?] **The installer was displayed by a wrong language or resulted in an error.**

☐ Is your system environment correct?

→ Confirm the settings of [Regional and Language Options]. Set the language settings of each tab to English (US).

[?] **NEC ESMPRO Agent (for Windows)**

→ For details of NEC ESMPRO Agent (for Windows), refer to "NEC ESMPRO Agent Installation Guide (Windows)" in EXPRESSBUILDER or its help.

[?] **NEC ESMPRO Manager**

→ For details of NEC ESMPRO Manager, refer to "NEC ESMPRO Manager Installation Guide" in EXPRESSBUILDER or its help.

5.11 For Optical Disk Drives

[?] **Unable to access or play DVD/CD-ROMs**

☐ Is the DVD/CD-ROM properly set in the optical disk drive tray?

→ There is a holder in the tray to secure the disk. Make sure that the disk is securely placed in the holder.

☐ Is the DVD/CD-ROM supported by the server?

→ For a disk such as a DVD/CD with copy guard which does not conform to the DVD/CD standard, the playback of such a DVD/CD with the optical disk drive is not guaranteed.

→ The DVD/CD-ROM for Macintosh is not supported.

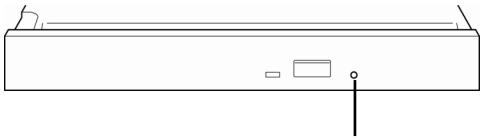
☐ Is the data side of the DVD/CD-ROM dirty or damaged?

→ Remove the DVD/CD-ROM from the optical disk drive, make sure that it is neither dirty nor damaged, set the DVD/CD-ROM again, and click [OK].

[?] **Unable to eject a disk using the eject button**

→ Eject the disk in the following procedure.

1. Press the POWER switch to turn off the server (POWER LED is off).
2. Use a 100 mm long metal pin that is 1.2 mm in diameter (or uncoil a thick paper clip) and insert it into the forced eject hole at the front of the tray. The location of the force eject hole may vary, depending on the drive.



Forced eject hole

Important

- **Do not use anything that easily breaks such as toothpicks or plastic.**
- **If you still cannot eject the disk, contact the maintenance service company.**

3. Pull the tray out with your hands.
4. Remove the disk.
5. Push the tray back to its original position.

5.12 When Power off

[?] **The power is not turned off**

☐ Is the suppression feature of the power switch enabled?

→ Restart the system once and start the BIOS setup utility.

The menu to be confirmed: **Server → Power Switch Inhibit**

6. Windows System Recovery

Recover the Windows system by following the instructions below if the files necessary to operate Windows are corrupt.

Note

- After recovering the system, be sure to install each driver and Starter Pack, referring to the descriptions about how to install Starter Pack and device driver in "*Installation Guide (Windows)*".
- If Hard Disk Drive cannot be recognized, you cannot recover the Windows system.
- Depending on the server configuration, you may be required to create a copy of OEM drivers on a removable media.

6.1 Recovery of Windows Server 2008 R2 and Windows Server 2008

If Windows does not start for some reason, you can recover Windows using the system recovery option. Be sure to perform this operation under the supervision of a user or administrator who has a thorough knowledge of this option. For details, refer to Windows Help.

When OEM drivers are required, copy the files under the following designated folder in EXPRESSBUILDER to a removable media.

- **Windows Server 2008 R2:** `\024\win\winnt\oemfd\ws2008r2`
- **Windows Server 2008 64-bit Edition:** `\024\win\winnt\oemfd\ws2008x64`
- **Windows Server 2008 32-bit Edition:** `\024\win\winnt\oemfd\ws2008`

6.2 Recovery of Windows Server 2003 R2 x64 Edition and Windows Server 2003

If Windows does not start for some reason, you can recover Windows using the recovery console. Be sure to perform this operation under the supervision of a user or administrator who has a thorough knowledge of this method. For details, refer to Windows Help.

When OEM drivers are required, copy the files under the following designated folder in EXPRESSBUILDER to a Flash FDD.

- **Windows Server 2003 R2 x64 Edition:** `\024\win\winnt\oemfd\w2k3amd`
- **Windows Server 2003 R2, Windows Server 2003:** `\024\win\winnt\oemfd\dotnet`

7. Resetting and Clearing the Server

Refer to this chapter when the server does not work or when you set BIOS settings back to the factory settings.

7.1 Software Reset

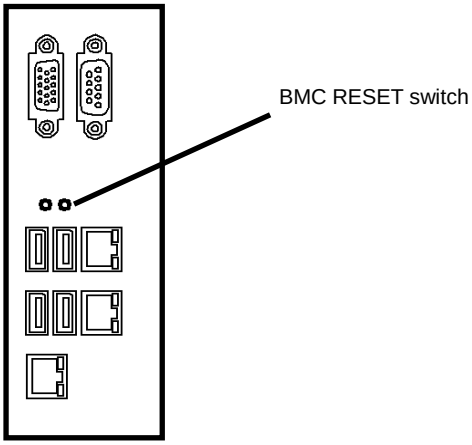
If the server halts before starting the OS, press <Ctrl> + <Delete> + <Alt> keys. This clears all the data in progress in memory, and restarts the server.

7.2 BMC RESET

Press BMC RESET Switch only if a problem occurs in EXPRESSSCOPE Engine 3 (BMC).

Do not press BMC RESET Switch in usual operation.

To reset the BMC, press BMC RESET Switch at least five seconds. Remote management feature is disabled for about 40 seconds after BMC is reset.



Tips Do not use the BMC RESET (M RESET) when BMC is operating normally.

7.3 Forced Shutdown

Use this function when an OS command does not shut down the server, the POWER switch does not turn off the server, or software reset does not work.

Continue to hold the POWER switch of the server for at least 4 seconds. The power is forcibly turned off **(To turn the power on again, wait approximately 10 seconds after turning off the power).**

Note If the remote power-on function is used, cycle the power once to load the OS after the power has been forcibly turned off, and then turn off the power again by shutting down the OS.

7.4 Clearing BIOS Settings (CMOS Memory)

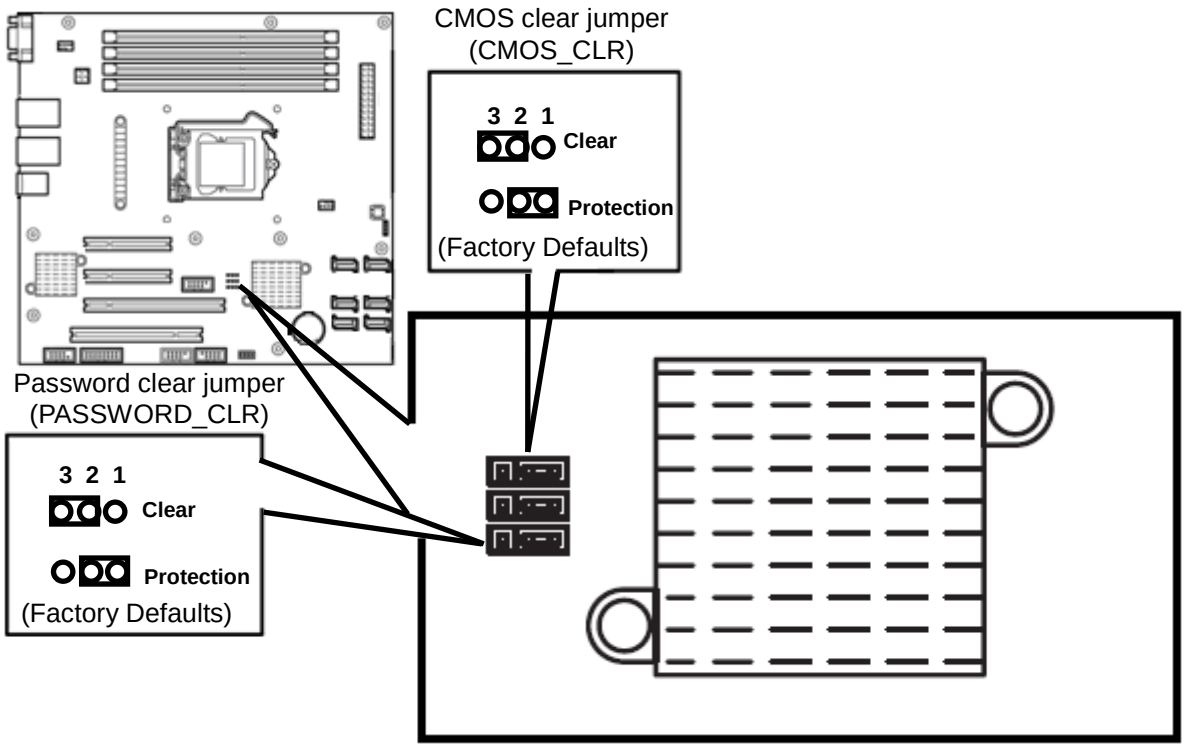
To set the BIOS settings back to the factory default settings (clearing CMOS memory), use the internal jumper switch.

You can also clear the password set in the BIOS Setup utility (SETUP) by using the same procedure.

Tips When the server works, use the BIOS setup utility (SETUP) to return the settings to the factory defaults.

To clear the password or the CMOS memory, use the corresponding configuration jumper switch illustrated in the figure below.

Important **Do not change any other jumper switch settings. Any change may cause the server to fail or malfunction.**



The following instructions show how to clear the CMOS memory and the password.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **Do not disassemble, repair, or alter the server.**
- **Do not remove the lithium, NiMH, or Li-ion batteries.**
- **Disconnect the power plug before installing or removing the server.**

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Make sure to complete installation.**
- **Be careful not to pinch your fingers in the server components.**
- **Avoid installing under extreme temperature conditions.**

Important **Take anti-static measures before operating the server. For detailed information on static electricity, refer to *Chapter 2 (1.2 Anti-static Measures)* in "*User's Guide*".**

- **Clearing CMOS memory**

1. Refer to "*Getting Started*" provided with this server or *Chapter 2 (1. Installing Internal Optional Devices)* in "*User's Guide*" to remove the side cover.
2. Confirm the position of the CMOS clearing jumper switch.
3. Change jumper switch settings from “Protection (1-2)” to “Clear (2-3).”

Note

- Use the clip provided with the jumper pin of the server.
- Do not lose the clip.

4. Wait about 5 seconds and return the jumper switch settings from “Clear (2-3)” to “Protection (1-2).”
5. Reattach the side cover.
6. Reassemble the removed components, connect the power cable, and press the POWER switch.
7. Press the <F2> key to start the BIOS Setup utility.

8. Execute **Load Setup Default** from the **Save & Exit** menu, configure the necessary settings, and save the changes.

- **Clearing a password**

1. Refer to "*Getting Started*" provided with this server or *Chapter 2 (1. Installing Internal Optional Devices)* in "*User's Guide*" to remove the side cover.
2. Confirm the position of the password clearing jumper switch.
3. Change jumper switch settings from "Protection (1-2)" to "Clear (2-3)."
4. Connect the power cable, the keyboard, the mouse, and the display, and then press the POWER switch.
   POST halts with the following error message
   ERROR
   8007: Password Cleared By Jumper.
   Press<F1> to resume, <F2> to Setup
5. Press the <F2> key to start the BIOS Setup utility.
6. Change the password. Next, execute [Save Changes and Exit].
7. Turn off the power, disconnect the power cable, and make preparations by repeating steps 1 and 2.
8. Return the jumper switch settings from "Clear (2-3)" to "Protection (1-2)."
9. Reattach the side cover, and connect the peripheral cables and the power cable to the server.

8. System Diagnostics

The System Diagnostics runs several tests on the server.

8.1 Test Items

The following items are tested in system diagnostics

- Memory
- CPU cache memory
- Hard Disk Drive

Important **Before executing the system diagnostics, be sure to disconnect the LAN cable. Executing the system diagnostics with the LAN cable connected may affect the network.**

Tips On checking the Hard Disk Drive, no data is written to the disk.

8.2 Startup and Exit of System Diagnostics

Start up System Diagnostics in the following procedure. (If the server is running, shutdown the system.)

1. Start up EXPRESSBUILDER and select **Tool menu** from **Boot** menu.

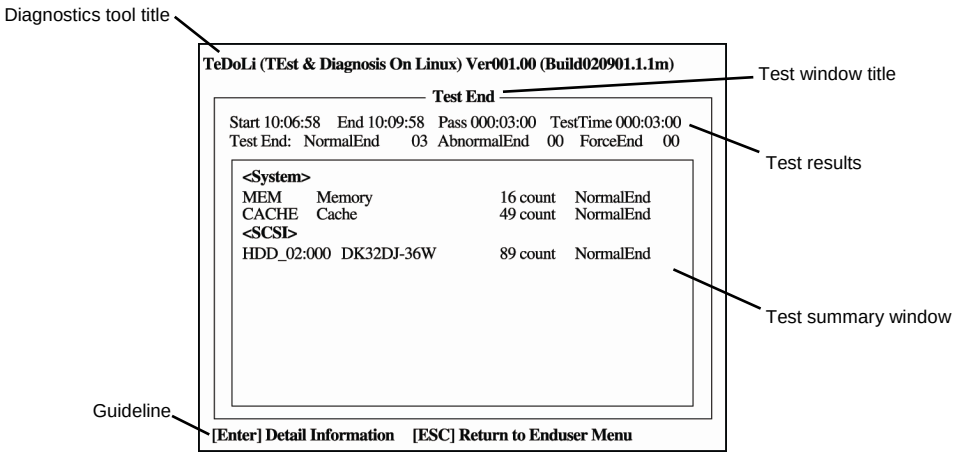
   For information on starting up EXPRESSBUILDER, refer to *Chapter 2 (5. Details of EXPRESSBUILDER)*.

   Note In case **Language selection menu** appears, select **English**.

2. Select **Test and diagnostics**.

   Select **End-User Mode** to start system diagnostics. This process takes about three minutes.

   When the diagnostics is completed, the screen display changes as shown below.



Diagnostics tool title
Shows the name and version of the diagnostic tool.

Test windows title
Shows the progress of the diagnostics. “Test End” is displayed when the diagnostics completes.

Test result
Shows the start, end, and elapsed time and completion status of the diagnostics.

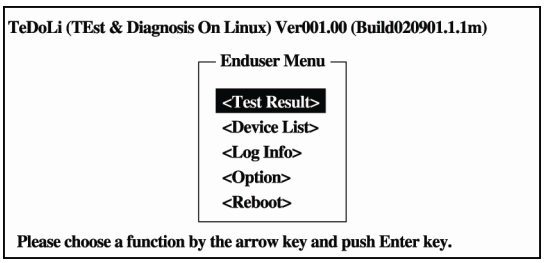
Guideline
Shows the details of the keys to operate window.

Test summary window
Shows the results of each test. Move the cursor and press the <Enter> key on the cursor line to display the details of the test.

When an error is detected by the system diagnostics, the relevant test result in the Test summary window is highlighted in red, and “Abnormal End” is displayed in the result on the right side.
Move the cursor to the test that detected the error, and press the <Enter > key. Take notes about the error message that has been output to the Detail Information screen and contact the store where you purchased the product or the maintenance service company.

3. Follow the guideline shown at the bottom of the screen, and press the <Esc> key.

   The **Enduser menu** below is displayed.



<Test Result>
Shows the diagnostics completion screen of the above diagnostics.

<Device List>
Shows a list of connected devices.

<Log Info>
Shows the log information of the diagnostics. Log information can be saved.
To save it, connect a FAT formatted removable media, and then select [Save(F)].

<Option>
Optional features can be used from this menu.

<Reboot>
Reboots the hardware.

4. Select **Reboot** in the **Enduser menu**.

   The server restarts. Remove EXPRESSBUILDER DVD from the drive.

System diagnostics is now completed.

9. Offline Tools

Offline tools are used for preventive maintenance, failure analysis, and their settings for this product.

9.1 Starting Offline Tools

Start up the offline tools in the following procedure.

1. Turn on the peripheral devices (such as display unit) and then the server.
2. Press <F4> key while the message below is displayed.

   `Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network.`
3. Keyboard Selection Menu appears after POST completion.When you select a keyboard type, the following menu is displayed.

Off-line TOOL MENU
Maintenance Utility BMC Configuration Exit

4. Select a desired feature from the menu.

   Refer to (9.2 Functions of Offline Tools) for more information.

9.2 Functions of Offline Tools

The offline tools offer the following functions.

Note When you start the offline tools while RDX is connected to the server, disable RDX before starting the offline tools by setting RDX to hibernate mode.

- **Off-line Maintenance Utility**

  The Offline Maintenance Utility is started when **Maintenance Utility** is selected. The Offline Maintenance Utility is used for preventive maintenance and failure analysis for this product. When you are unable to start NEC ESMPRO due to a failure, the Offline Maintenance Utility can be used to check the cause of the failure.

  Important **The Off-line Maintenance Utility is intended for mainenance personnel. Consult with your service representative if a trouble that requires Off-line Maintenance Utility occurs.**

  After starting up the Off-line Maintenance Utility, the following features are available to run.

  – IPMI Information Viewer

    Displays System Event Log (SEL), Sensor Data Record (SDR), and Field Replaceable Unit (FRU) in IPMI (Intelligent Platform Management Interface) and also back up such information.

    Using this feature, system errors and events can be investigated to locate the parts to be replaced.

    You can also clear the System Event Log (SEL) area, and specify the operation when the System Event Log (SEL) area becomes full.

  – System Information Viewer

    Displays information on processor (CPU), BIOS.

    Also output the information to a text file.

  – System Information Management

    Set the information specific to your server (Product information, Chassis information).

- **BMC Configuration**

  – It is used for setups of alert functions by BMC (Baseboard Management Controller) and remote control functions by PC for Management.

9.3 Console-less

The Off-line tools can be remotely controlled from PC for Management without requiring keyboard or other consoles to be connected.

9.3.1 How to remotely control

Control from a LAN connected PC for Management using the remote KVM of EXPRESSSCOPE engine 3.

For details of the remote KVM, refer to "*EXPRESSSCOPE Engine 3 User's Guide*" in EXPRESSBUILDER.

Note Connect the LAN cable to the connector on management LAN port. Or, if Shared BMC LAN feature is used, connect the LAN cable to the corresponding LAN connector.

You can also control Off-line Tools remotely by using BIOS Console Redirection.

9.3.2 Preparation

Set the remote management feature of EXPRESSSCOPE Engine 3 in advance to check hardware error information during console-less operation.

For settings information, refer to "*EXPRESSSCOPE Engine 3 User's Guide*" or *NEC ESMPRO Manager online help*.

NEC Express5800 Series
Express5800/GT110e-S

2 Convenient Features

This chapter describes convenient features for using the server. Refer to this chapter according to your purpose and need.

1. **System BIOS**
   Describes the BIOS settings and parameters.

2. **Flash FDD**
   Describes the Flash FDD.

3. **Power Control Features**
   Describes the power control feature.

4. **RAID System Configuration**
   Describes the RAID configuration utility installed in the server.

5. **Details of EXPRESSBUILDER**
   Describes the EXPRESSBUILDER attached to the server.

6. **EXPRESSSCOPE Engine 3**
   Describes EXPRESSSCOPE Engine 3.

7. **NEC ESMPRO**
   Describes NEC ESMPRO Agent and NEC ESMPRO Manager, applications to manage and monitor the server.

8. **Device Information Collection Utility**
   Describes the device information collection utility

9. **Universal RAID Utility**
   Describes Universal RAID Utility, an application to manage or monitor the RAID Controllers.

1. System BIOS

You can check and change the parameters using the BIOS Setup utility (SETUP).

1.1 Starting SETUP

Turn on the server and proceed with POST.

Wait until the following message appears at the bottom left of the screen.

```
Press <F2> SETUP, ...
```
(* a different message may appear depending on the environment)

If you press <F2>, SETUP will start after POST, and the main menu will appear. (You can also start SETUP by pressing <F2> key while expanding option ROM.)

1.2 Parameter Descriptions

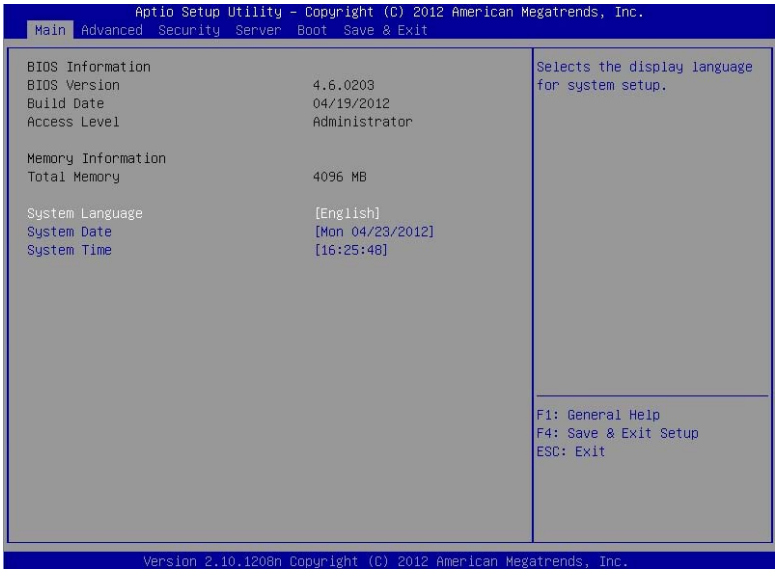
The SETUP utility has the following six major menus.

- Main menu
- Advanced menu
- Security menu
- Server menu
- Boot menu
- Save & Exit menu

These menu has submenus for relevant items. Selecting submenus allows you to configure further detailed parameters.

1.2.1 Main

If you start up the SETUP utility, the **Main** menu is displayed first.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
BIOS Information
BIOS Version 4.6.0203
Build Date 04/19/2012
Access Level Administrator
Memory Information
Total Memory 4096 MB
System Language [English]
System Date [Mon 04/23/2012]
System Time [16:25:48]
Selects the display language for system setup.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

The table below shows the items you can configure on the **Main** menu.

Option	Parameter	Descriptions
BIOS Information	–	–
BIOS Version	–	Displays the BIOS version (display only).
Build Date	MM/DD/YYYY	Displays the BIOS build date (display only).
Access Level	[Administrator] User	Displays the access level of the login user, Administrator or User (display only). If no password is specified, **Administrator** is displayed.
Memory Information	–	–
Total Memory	–	Displays the basic memory capacity (display only).
System Language	[English] Français Español Deutsch Italiano	Select the display language for the BIOS. If you run SETUP with **BIOS Redirection Port** enabled, **English** is automatically selected for **System Language**. At that time, you cannot change setting of **System Language**. If **BIOS Redirection Port** is disabled, the language set in this option is used at the next startup of SETUP, and you can change the language setting.
System Date	WWW MM/DD/YYYY	Set the system date.
System Time	HH:MM:SS	Set the system time

[ ]: Factory settings

Tips

Be sure to confirm that the date and time in the BIOS parameters are correctly configured. In any of the following situations, check the system time before using the server.

- After transporting the server
- After removing the server from storage
- After the server wakes up from hibernating in an environment out of the guaranteed operating range (temperature: 10°C to 40°C; humidity: 20% to 80%

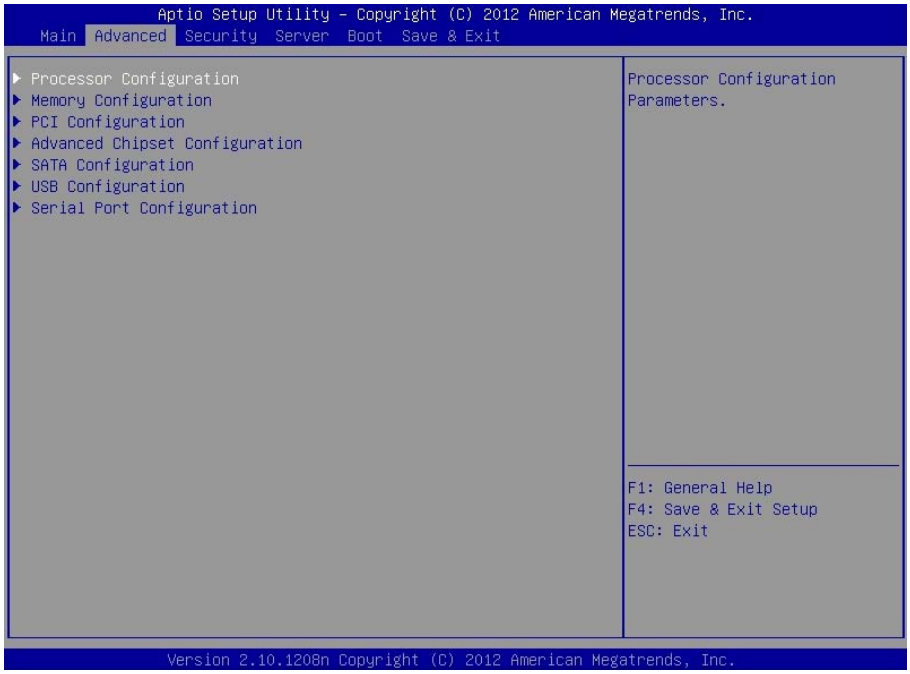
Check the system clock monthly. Additionally, if you implement the server in a system that requires highly accurate time, use of a time server (an NTP server) is recommended.

If the system time becomes considerably slow or fast over time even though you regularly adjust it, contact the dealer where you purchased the server or the maintenance service company for maintenance.

1.2.2 Advanced

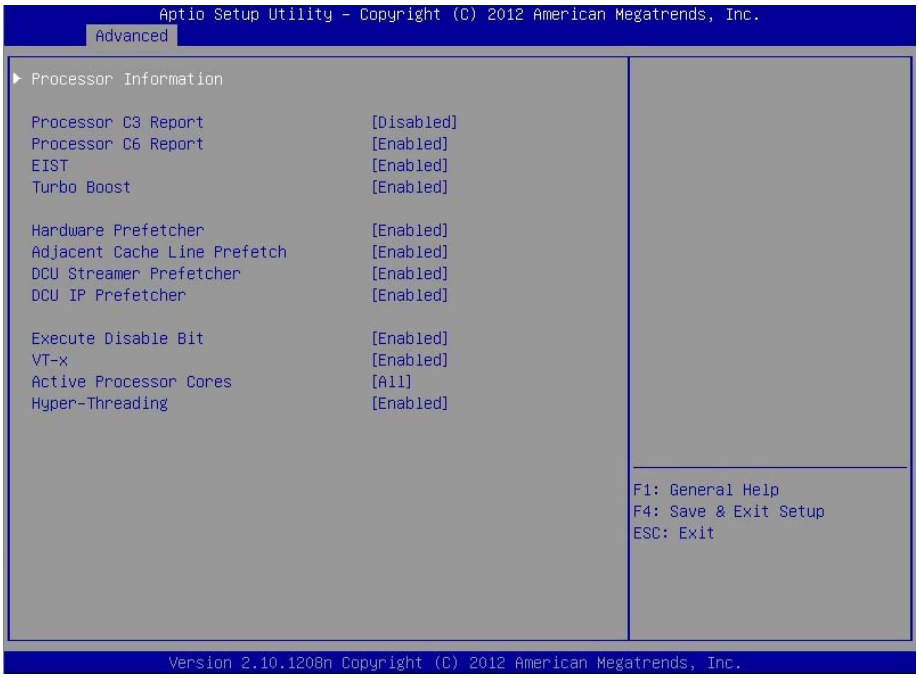
If you move the cursor to **Advanced**, the **Advanced** menu appears.

For the menus that show a "▶" to their left (all menus on this screen), press the <Enter> key to display its submenu, and then change the settings.



(1) Processor Configuration submenu

From the **Advanced** menu, select **Processor Configuration** and then press the <Enter> key to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus.

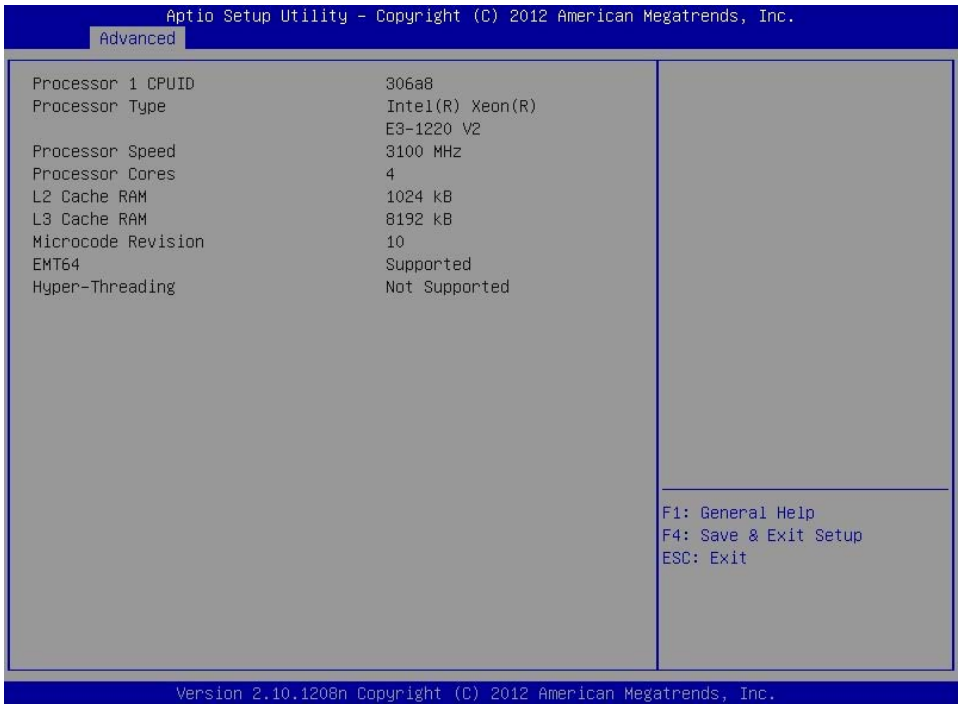


For details about the options, see the table below.

Option	Parameter	Descriptions
Processor Information	–	–
Processor C3 Report	[Disabled] ACPI C2 ACPI C3	Specify C3 state of processor to be reported to OS.
Processor C6 Report	Disabled [Enabled]	Enable or disable the feature to report C6 state of processor to OS.
EIST	Disabled [Enabled]	Enable or disable Enhanced Intel SpeedStep(R) Technology feature. This option is displayed only when the installed processor supports this featue.
Turbo Boost	Disabled [Enabled]	Enable or disable Intel Turbo Boost Technology. Able to display and configure this setting only when the processor that supports this feature is installed.
Hardware Prefetcher	Disabled [Enabled]	Enable or disable Hardware Prefetcher
Adjacent Cache Line Prefech	Disabled [Enabled]	Set the optimal access from memory to cashe to either Enabled or Disabled.
DCU Streamer Prefetcher	Disabled [Enabled]	Enable or disable the prefetcher of L1 data cache.
DCU IP Prefetcher	Disabled [Enabled]	Enable or disable the prefetcher of L1 cache. If set to Enabled, the speed to process sequentially organized codes improves.
Execute Disabled Bit	Disabled [Enabled]	Enable or disableExecute Disable Bit feature. This option is displayed only when the installed processor supports this featue.
VT-x	Disabled [Enabled]	Enable or disable Intel Virtualization Technology feature.
Active Processor Cores	[All] 1 2 3	Specify the number of active cores in processor. The selectable number of cores depends on processor installed.
Hyper-Threading	Disabled [Enabled]	Enable or disable the feature to simultaneously execute two threads in a single core. This option is displayed only when the installed processor supports this featue.

[ ]: Factory settings

(a) Processor Information submenu


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Processor 1 CPUID 306a8
Processor Type Intel(R) Xeon(R) E3-1220 V2
Processor Speed 3100 MHz
Processor Cores 4
L2 Cache RAM 1024 kB
L3 Cache RAM 8192 kB
Microcode Revision 10
EMT64 Supported
Hyper-Threading Not Supported
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

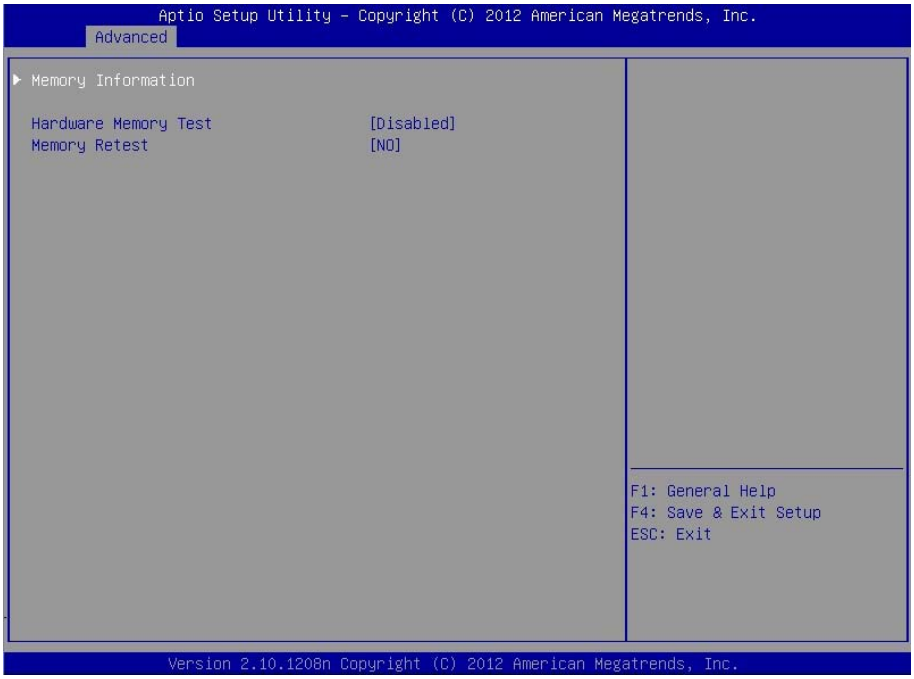
For details about the options, see the table below (display only).

Option	Parameter	Descriptions
Processor 1 CPUID	Number Error	Number displayed here means the ID of Processor 1. **Error** indicates an error was detected during POST.
Processor Type	–	Displays the type of Processor 1.
Processor Speed	–	Displays the clock speed of Processor 1.
Processor Cores	–	Displays the number of active cores in Processor 1.
L2 Cache RAM	–	Displays the secondary cache size of processor 1.
L3 Cache RAM	–	Displays the tertiary cache size of processor 1.
Microcode Revision	–	Displays the revision of the microcode applied to processor 1.
EMT64	Supported	Displays **Supported** when processor 1 supports Intel 64 architecture.
Hyper-Threading	Supported	Displays **Supported** when processor 1 supports Hyper-Threading Technology feature.

[ ]: Factory setting

(2) Memory Configuration submenu

From the **Advanced** menu, select **Memory Configuration** and then press the <Enter> key to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus.

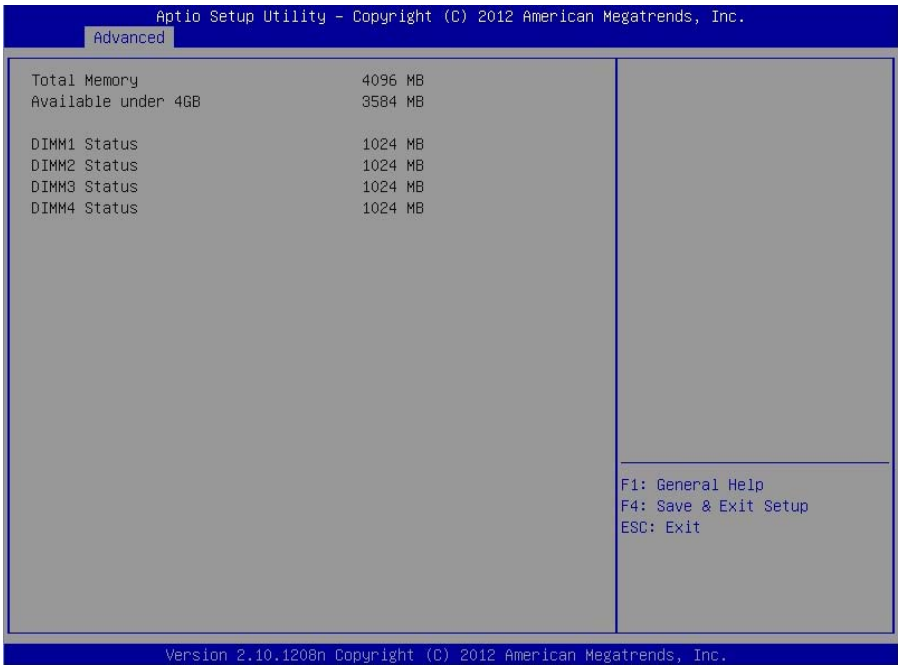

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
▶ Memory Information
Hardware Memory Test [Disabled]
Memory Retest [NO]
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below.

Option	Parameter	Descriptions
Memory Information	–	–
Hardware Memory Test	[Disabled] Enabled	Specify whether to perform a memory test. If this option is set to **Enabled**, and if an error is detected during the test, the applicable memory resource will be disabled.
Memory Retest	[No] Yes	If this option is set to **Yes**, the memory error information is cleared and all DIMMs are tested on the next startup. After the next startup, this option is automatically switched to **No**.

[ ]: Factory setting

(a) Memory Information submenu


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Total Memory 4096 MB
Available under 4GB 3584 MB
DIMM1 Status 1024 MB
DIMM2 Status 1024 MB
DIMM3 Status 1024 MB
DIMM4 Status 1024 MB
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

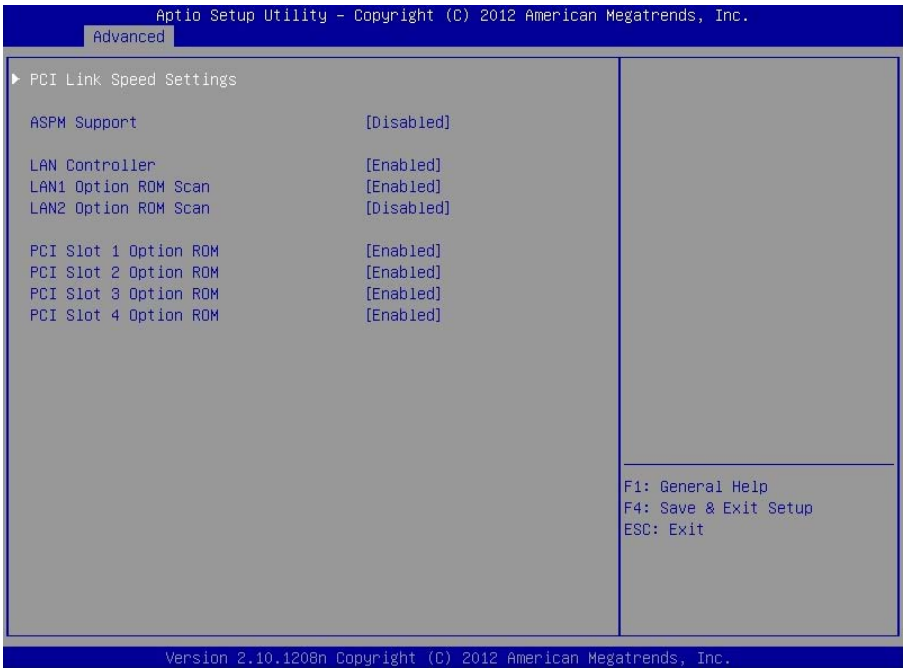
For details about the options, see the table below (display only).

Option	Parameter	Descriptions
Total Memory	–	Displays the basic memory capacity.
Available under 4 GB	–	Displays the amount of available memory in an area at 4 GB or less.
DIMM1 Status **DIMM2 Status** **DIMM3 Status** **DIMM4 Status**	Number Disabled Not Present Error	Displays the current memory status. The number displayed here corresponds to a DIMM slot number. The number indicates the amount of memory as well as means that memory is normal. The list below shows the meanings of the other statuses. Disabled: The memory has failed Not Present: No memory is installed Error: Forced memory startup

[ ]: Factory setting

(3) PCI Configuration submenu

From the **Advanced** menu, select **PCI Configuration** and then press the <Enter> key to display the menu screen as shown below.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
PCI Link Speed Settings
ASPM Support [Disabled]
LAN Controller [Enabled]
LAN1 Option ROM Scan [Enabled]
LAN2 Option ROM Scan [Disabled]
PCI Slot 1 Option ROM [Enabled]
PCI Slot 2 Option ROM [Enabled]
PCI Slot 3 Option ROM [Enabled]
PCI Slot 4 Option ROM [Enabled]
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

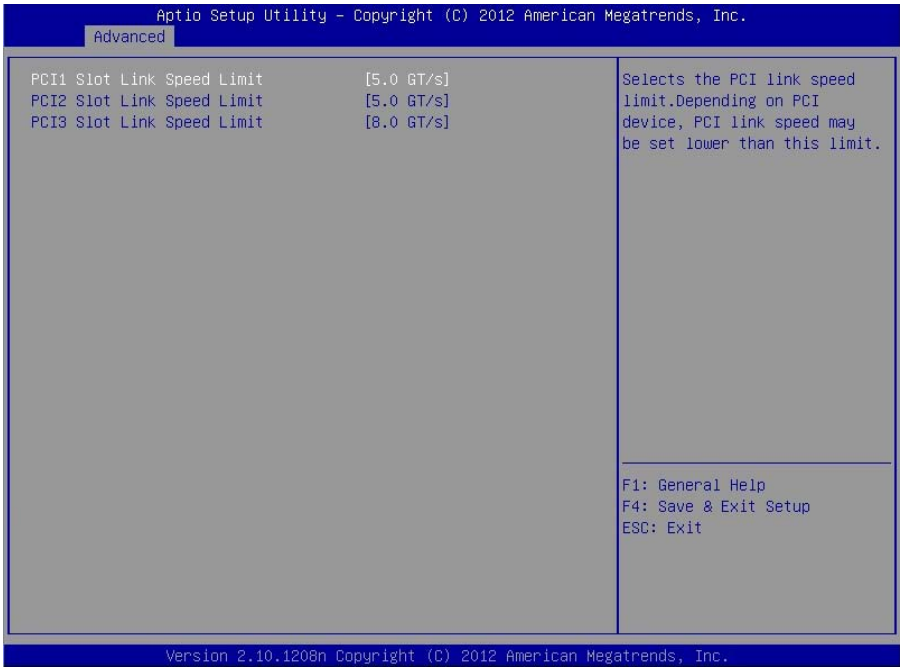
For details about the options, see the table below.

Option	Parameter	Descriptions
PCI Link Speed Settings	–	–
ASPM Support	[Disabled] Auto Force L0s	Specify the level of Active State Power Management. If **Auto** is selected, the level supported by the system is automatically set. If **Force L0s** is selected, all links are forcibly set to L0s.
LAN Controller	Disabled [Enabled]	Enable or disable the on-board LAN controller.
LAN1 Option ROM Scan	Disabled [Enabled]	Enable or disable the option ROM SCAN for on-board LAN 1.
LAN2 Option ROM Scan	[Disabled] Enabled	Enable or disable the option ROM SCAN for on-board LAN 2.
PCI Slot 1 Option ROM **PCI Slot 2 Option ROM** **(PCI Slot 3 Option ROM)** **(PCI Slot 4 Option ROM)**	Disabled [Enabled]	Enable or disable the option ROM on each PCI board. **PCI Slot 3 Option ROM** and **PCI Slot 4 Option ROM** are displayed only on server of air-cooling system model.

[ ]: Factory setting

Note For a RAID Controller, LAN card (network boot), or Fibre Channel controller, if no Hard Disk Drive on which an OS is installed is connected, set the option ROM for that slot to **Disabled**.

(a) PCI Link Speed Settings submenu


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
PCI1 Slot Link Speed Limit [5.0 GT/s]
PCI2 Slot Link Speed Limit [5.0 GT/s]
PCI3 Slot Link Speed Limit [8.0 GT/s]
Selects the PCI link speed limit.Depending on PCI device, PCI link speed may be set lower than this limit.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

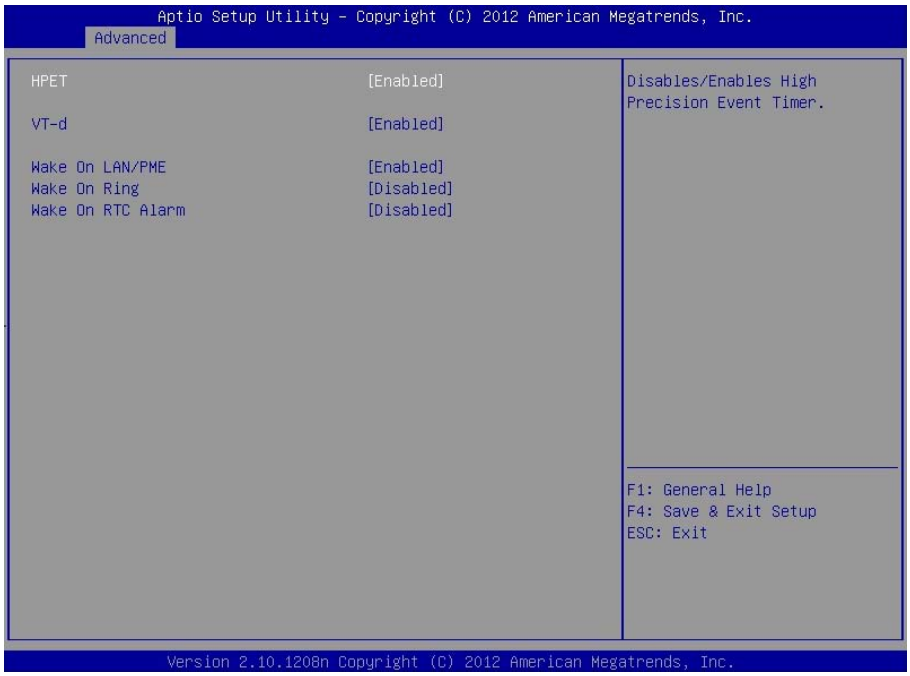
For details about the options, see the table below.

Option	Parameter	Descriptions
PCI1 Slot Link Speed Limit	2.5 GT/s [5.0 GT/s]	Specify the upper limit of link speed of PCI slot #1.
PCI2 Slot Link Speed Limit	2.5 GT/s [5.0 GT/s]	Specify the upper limit of link speed of PCI slot #2.
PCI3 Slot Link Speed Limit	2.5 GT/s [5.0 GT/s] [8.0 GT/s]	Specify the upper limit of link speed of PCI slot #3. **PCI3 Slot Link Speed Limit** is displayed only on the server of air-cooling system model. **8.0 GT/s** is displayed only on the server on which Intel® Xeon® processor is installed.

[ ]: Factory settings

(4) Advanced Chipset Configuration submenu

From the **Advanced** menu, select **Advanced Chipset Configuration** and then press the <Enter> key to display the menu screen as shown below.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
HPET [Enabled]
VT-d [Enabled]
Wake On LAN/PME [Enabled]
Wake On Ring [Disabled]
Wake On RTC Alarm [Disabled]
Disables/Enables High Precision Event Timer.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below.

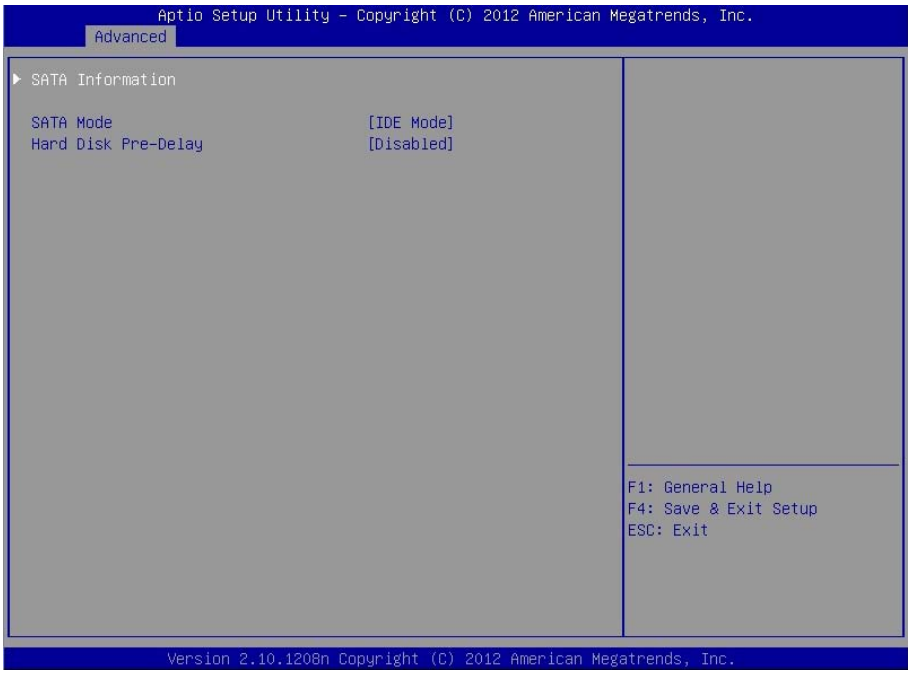
Option	Parameter	Descriptions
HPET	Disabled [Enabled]	Enable or disable the High-Precision Event Timer. This feature may not be supported depending on OS.
VT-d	Disabled [Enabled]	Enable or disable Intel(R) Virtualization Technology for Directed I/O feature. This option is displayed only when the installed processor supports this feature.
Wake On LAN/PME	Disabled [Enabled]	Enable or disable the feature that remotely powers on through a network.
Wake On Ring	[Disabled] Enabled	Enable or disable the feature that remotely powers on via serial ports (modems).
Wake On RTC Alarm	[Disabled] Enabled	Enable or disable the feature that remotely powers on using the real time clock.

[ ]: Factory setting

Note If the AC power is turned off, the Wake on Ring feature is not available on the next system boot after AC power-on. Press the Power switch to boot the system.

(5) SATA Configuration submenu

From the **Advanced** menu, select **SATA Configuration** and then press the <Enter> key to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
SATA Information
SATA Mode [IDE Mode]
Hard Disk Pre-Delay [Disabled]
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

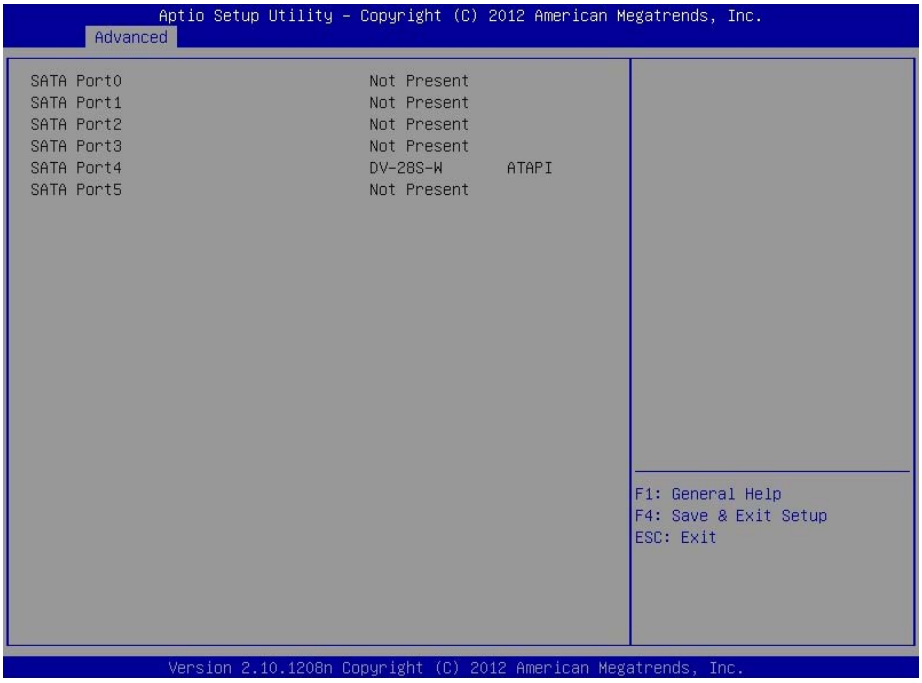
For details about the options, see the table below.

Option	Parameter	Descriptions
SATA Information	–	This option is not displayed when SATA Mode is set to **RAID Mode**.
SATA Mode	Disabled [IDE Mode] AHCI Mode RAID Mode	Set SATA Mode. For the models that show **RAID Mode**, this option is only for display.
Hard Disk Drive Pre-Delay	[Disable] 3 Seconds 6 Seconds 9 Seconds 12 Seconds 15 Seconds 21 Seconds 30 Seconds	Specify delay time before HDD is accessed during POST.

[ ]: Factory setting

Note NEC has not verified AHCI driver support.

(a) SATA Information submenu


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
SATA Port0 Not Present
SATA Port1 Not Present
SATA Port2 Not Present
SATA Port3 Not Present
SATA Port4 DV-28S-W ATAPI
SATA Port5 Not Present
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

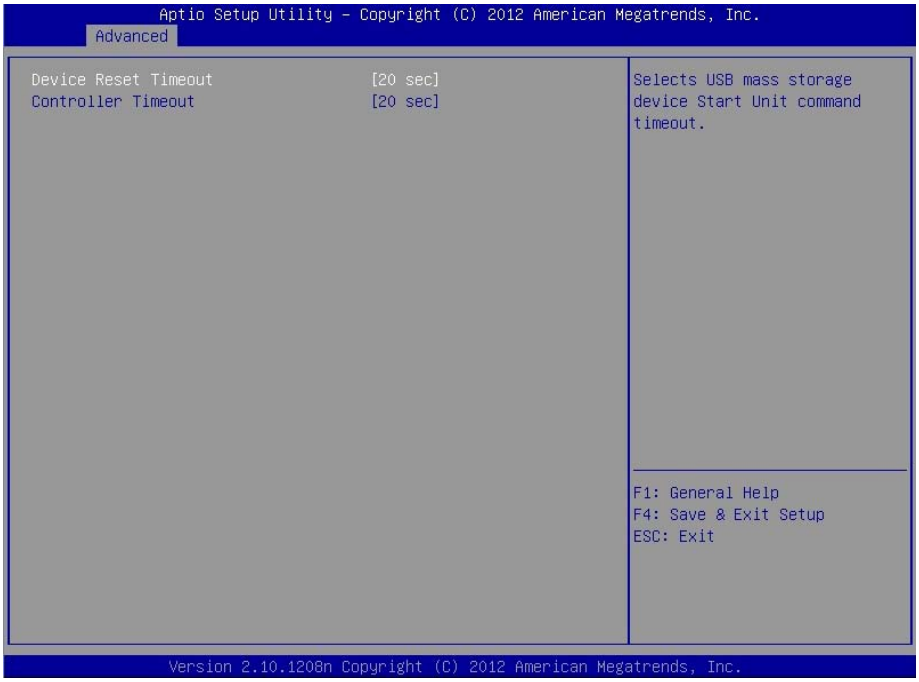
For details about the options, see the table below (display only).

Option	Parameter	Descriptions
SATA Port0	–	Displays the devices connected to each port. If no device connected, **Not Present** is shown for that port.
SATA Port1		
SATA Port2		
SATA Port3		
SATA Port4		
SATA Port5		

[ ]: Factory setting

(6) USB Configuration submenu

From the **Advanced** menu, select **USB Configuration** and then press the <Enter> key to display the menu screen shown below.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Device Reset Timeout [20 sec]
Controller Timeout [20 sec]
Selects USB mass storage device Start Unit command timeout.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

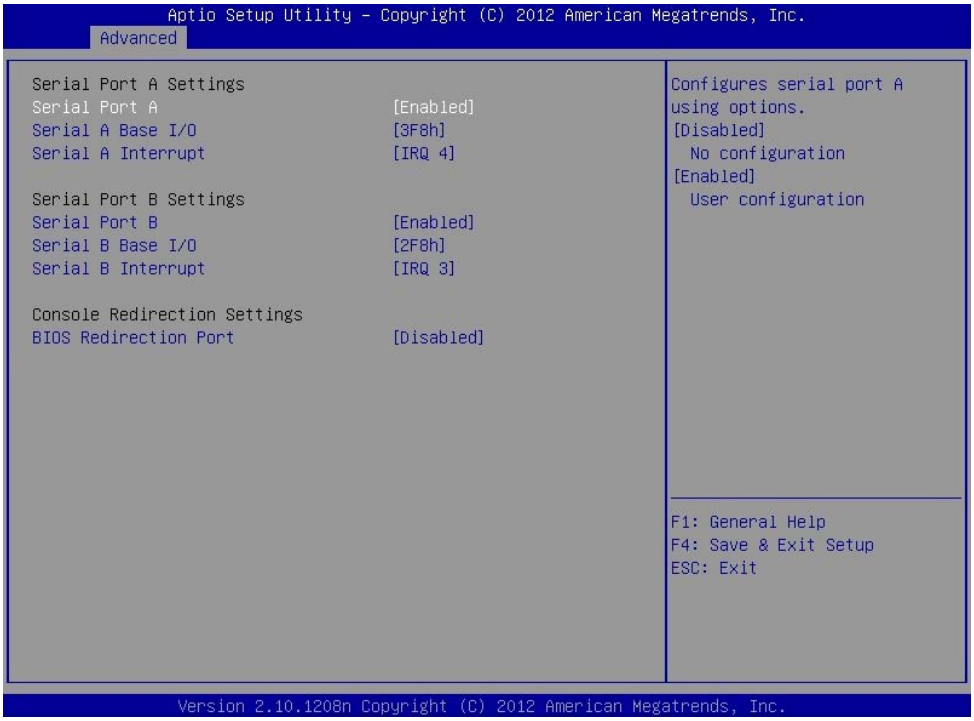
For details about the options, see the table below.

Option	Parameter	Descriptions
Device Reset Timeout	10 sec [20 sec] 30 sec 40 sec	Specify the time to wait when issuing a Start Unit command to a USB mass storage device until a timeout occurs.
Controller Timeout	1 sec 5 sec 10 sec [20 sec]	Specify the time to wait when issuing Control, Bulk, or Interrupt Transfer command to a USB Controller until a timeout occurs.

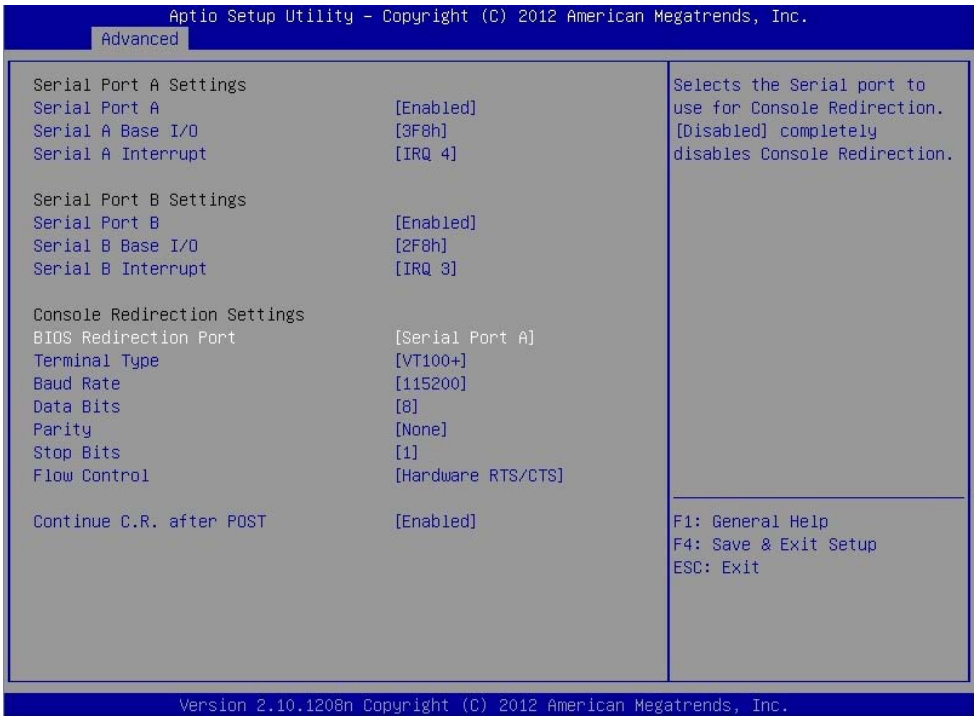
[ ]: Factory setting

(7) Serial Port Configuration submenu

From the **Advanced** menu, select **Serial Port Configuration** and then press the <Enter> key to display the menu screen shown below.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Serial Port A Settings
Serial Port A [Enabled]
Serial A Base I/O [3F8h]
Serial A Interrupt [IRQ 4]
Serial Port B Settings
Serial Port B [Enabled]
Serial B Base I/O [2F8h]
Serial B Interrupt [IRQ 3]
Console Redirection Settings
BIOS Redirection Port [Disabled]
Configures serial port A using options.
[Disabled]
No configuration
[Enabled]
User configuration
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

From **BIOS Redirection Port**, select **Serial Port A** or **Serial Port B** and then press the <Enter> key to display the menu screen shown below.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Serial Port A Settings
Serial Port A [Enabled]
Serial A Base I/O [3F8h]
Serial A Interrupt [IRQ 4]
Serial Port B Settings
Serial Port B [Enabled]
Serial B Base I/O [2F8h]
Serial B Interrupt [IRQ 3]
Console Redirection Settings
BIOS Redirection Port [Serial Port A]
Terminal Type [VT100+]
Baud Rate [115200]
Data Bits [8]
Parity [None]
Stop Bits [1]
Flow Control [Hardware RTS/CTS]
Continue C.R. after POST [Enabled]
Selects the Serial port to use for Console Redirection. [Disabled] completely disables Console Redirection.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

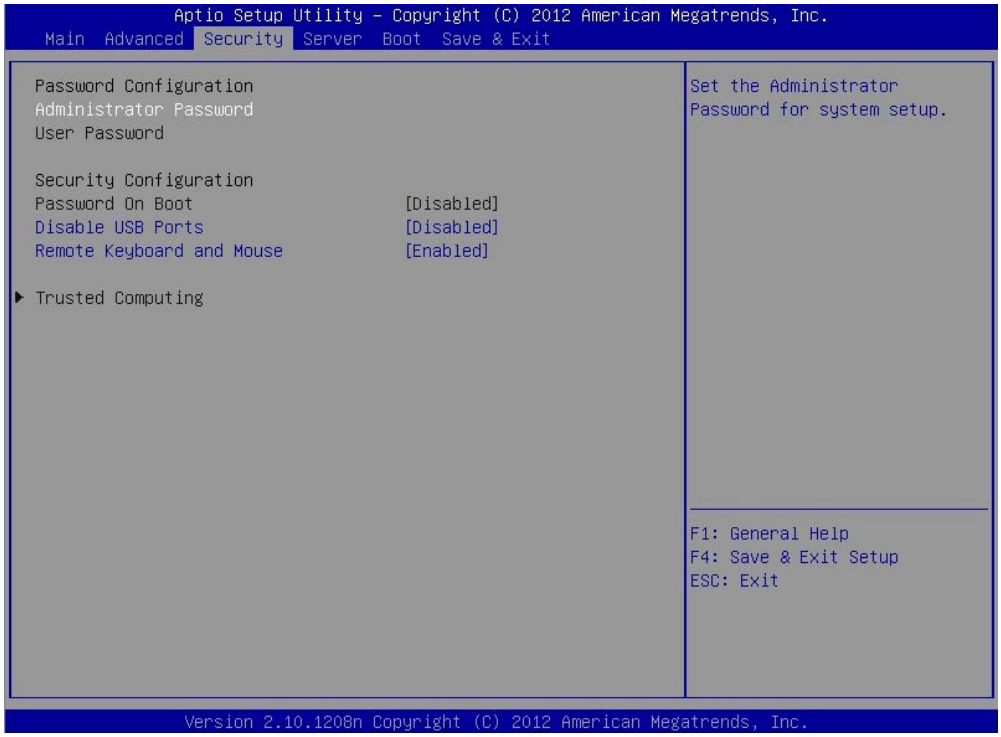
For details about the options, see the table below.

Option	Parameter	Descriptions
Serial Port A Settings	–	–
Serial Port A	Disabled [Enabled]	Enable or disable serial Port A
Serial A Base I/O	[3F8h] 2F8h 3E8h 2E8h	Specify the base I/O address for serial port A.
Serial A Interrupt	[IRQ 4] IRQ 3	Specify the interrupt for serial port A
Serial Port B Settings	–	–
Serial Port B	Disabled [Enabled]	Enable or disable serial Port B
Serial B Base I/O	3F8h [2F8h] 3E8h 2E8h	Specify the base I/O address for serial port B
Serial B Interrupt	IRQ 4 [IRQ 3]	Specify the interrupt for serial port B
Console Redirection Settings	–	–
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Enable or disable the console redirection feature for the specified serial port. Specifying [Serial Port A] or [Serial Port B] allows direct connection via terminal unit such as NEC ESMPRO Manager, and options for connection shown below are displayed.
Terminal Type	[VT100+] VT-UTF8 ANSI	Select the terminal type.
Baud Rate	9600 19200 57600 [115200]	Specify the baud rate.
Data Bits	7 [8]	Specify the data bit width.
Parity	[None] Even Odd	Specify the parity type.
Stop Bits	[1] 2	Specify stop bits.
Flow Control	None [Hardware RTS/CTS]	Specify the flow control method.
Continue C.R. after POST	Disabled [Enabled]	Enable or disable the feature to continue console redirection after completion of POST.

[ ]: Factory setting

1.2.3 Security

If you move the cursor to **Security**, the **Security** menu appears. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus. Then configure the settings.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
Password Configuration
Administrator Password
User Password
Security Configuration
Password On Boot [Disabled]
Disable USB Ports [Disabled]
Remote Keyboard and Mouse [Enabled]
▶ Trusted Computing
Set the Administrator Password for system setup.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

Select either **Administrator Password** or **User Password**, and then press the <Enter> key to display the screen where you can register/change the password.

Tips

- User Password cannot be set without setting Administrator Password
- Do not set any password before installing OS.
- If you have forgotten any password, contact the store where you purchased the product or your maintenance service company.

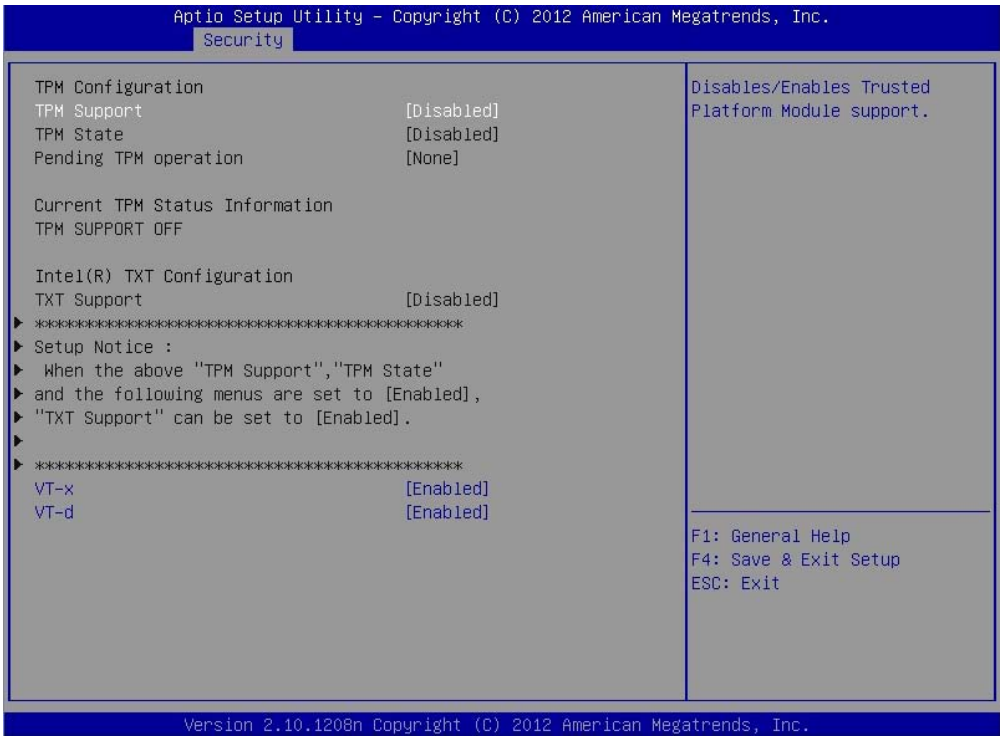
For details about the options, see the table below.

Option	Parameter	Descriptions
Password Configuration	–	–
Administrator Password	Up to 20 alphanumeric characters	When the <Enter> key is pressed, the administrator password entry screen is displayed. This password can be used to access all **SETUP** menus. This setting can only be specified by logging in as **Administrator**.
User Password	Up to 20 alphanumeric characters	When the <Enter> key is pressed, the user password entry screen is displayed. With this password, access to **SETUP** menus is limited. This setting can only be specified by logging in as **Administrator**.
Security Configuration	–	–
Password On Boot	[Disabled] Enabled	Enable or disable the feature that requires a password entry on boot. This option can be selected when **Administrator Password** is set.
Disable USB Ports	[Disabled] Front Rear Internal Front + Rear Front + Internal Rear + Internal Front + Rear + Internal	Enable or disable USB ports
Remote Keyboard and Mouse	Disabled [Enabled]	Enable or disable the remote keyboard and mouse supported by BMC.
Trusted Computing		This submenu is available for configuration only when **Administrator Password** has been set.

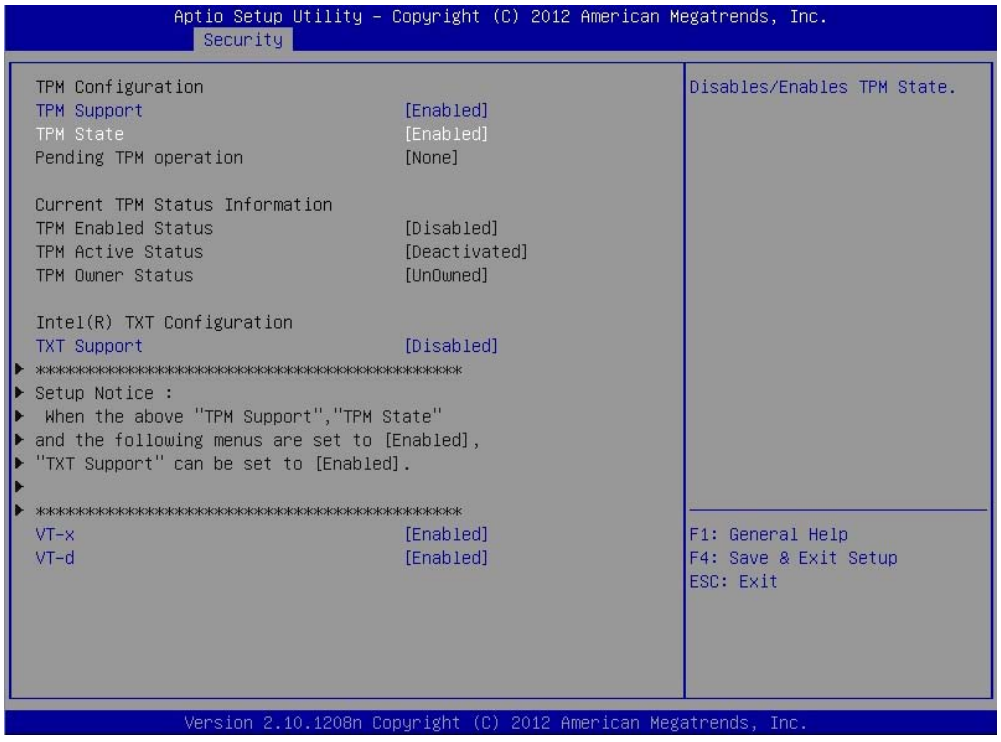
[ ]: Factory setting

(1) Trusted Computing submenu

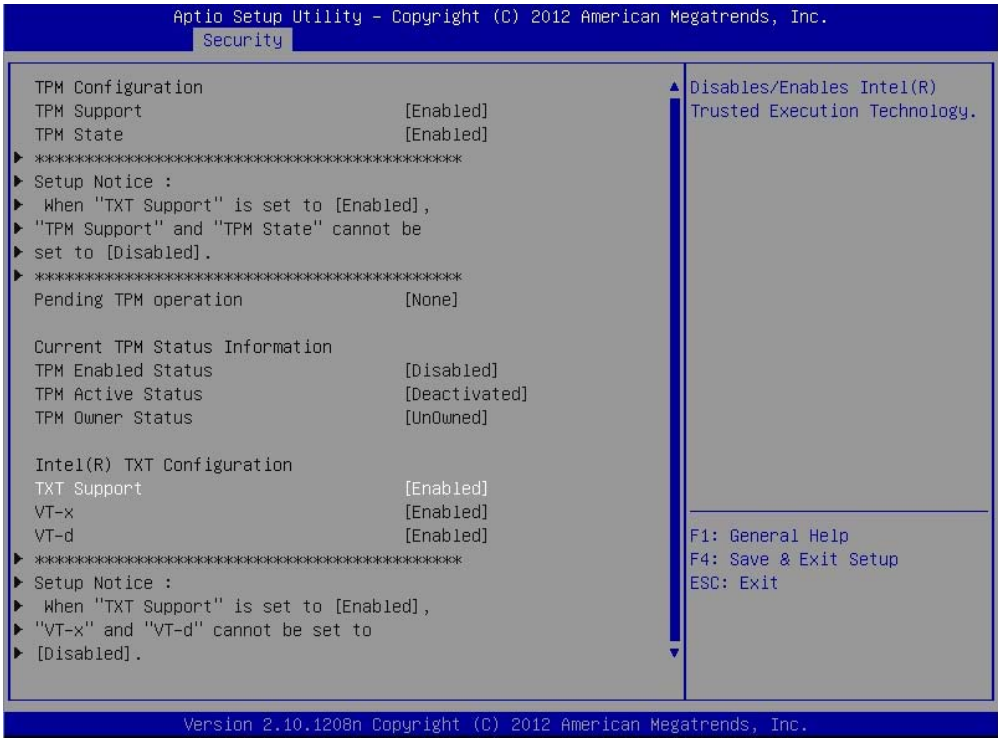
From the **Security** menu, select **Trusted Computing** and then press the <Enter> key to display the menu screen shown below.



If you enable **TPM Support** then **TPM State**, the following menu screen appears.



If TXT Support is enabled, the following screen is displayed.



For details about the options, see the table below.

Option	Parameter	Descriptions
TPM Configuration	–	–
TPM Support	[Disabled] Enabled	Enable or disable Trusted Platform Module feature. When set to **Enabled**, **Current TPM Status Information** is displayed.
TPM State	[Disabled] Enabled	Enable or disable TPM features. This option can be changed when **TPM Support** is enabled.
Pending TPM operation	[None] Enable Take Ownership Disable Take Ownership TPM Clear	Specify TPM operation. This option can be selected when TPM State is set to **Enabled**.
Current TPM Status Information	–	–
TPM Enabled Status	Enabled Disabled	Displays TPM Support Status (Display only)
TPM Active Status	Activated Deactivated	
TPM Owner Status	Owmed UnOwned	
Intel(R) TXT Configuration	–	–
TXT Support	[Disabled] Enabled	Enable or disable Trusted Execution Technology. This option can be changed when **TPM State** is enabled.
VT-x	Disabled [Enabled]	Enable or disable Intel(R) Virtualization Technology for Directed processor feature.
VT-d	Disabled [Enabled]	Enable or disable Intel(R) Virtualization Technology for Directed I/O feature. This option is displayed only when the installed processor supports this feature.

[ ]: Factory setting

1.2.4 Server

If you move the cursor to **Server**, the **Server** menu screen appears. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus.

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
System Management
Assert NMI on PERR [Enabled]
Assert NMI on SERR [Enabled]
FRB-2 Policy [Retry 3 Times]
Boot Monitoring [Disabled]
Boot Monitoring Policy [Retry 3 Times]
Thermal Sensor [Enabled]
Check previous System Config [Disabled]
BMC IRQ [IRQ 11]
POST Error Pause [Enabled]
Memory Error [Boot]
Power Switch Inhibit [Disabled]
Standby Power Save [Disabled]
AC-LINK [Power On]
Power On Delay Time Mode [Manually Setting]
Power ON Delay Time 40
CLI SETUP [Disabled]
Additional setup menus to view server management features.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

The **Server** menu screen shows the options you can configure and their features. For the menu **System Management**, move the cursor to it and then press the <Enter> key to show its submenus.

(1/2)

Option	Parameter	Descriptions
System Management	–	–
Assert NMI on PERR	Disabled [Enabled]	Specify whether to support PCI PERR.
Assert NMI on SERR	Disabled [Enabled]	Specify whether to support PCI PERR.
FRB-2 Policy	[Retry 3 Times] Disable FRB2 Timer Always Reset	Specify how the system should operate if FRB level 2 errors occur.
Boot Monitoring	[Disabled] 5-60 minutes	Enable or disable the boot monitoring feature and specify the timeout period. To use this feature, install NEC ESMPRO Agent on Windows. If starting up an OS on which it is not installed, disable this feature.
Boot Monitoring Policy	[Retry 3 times] Always Reset	Specify the processing to be done when time-out was enforced during boot monitoring. This is configurable only if **Boot Monitoring** has been enabled. **Retry 3 times** resets the server upon the timeout and attempts to boot OS up to three times. **Always Reset** retries booting the OS repeatedly.

(2/2)

Option	Parameter	Descriptions
Thermal Sensor	Disabled [Enabled]	Enable or disable the thermal sensor monitoring function. If this option is set to **Enabled** and when abnormal temperature is detected, the system stops at the end of POST.
Check previous System Config	[Disabled] Enabled	If this option is set to **Enabled** and the system configuration differs from the previous boot, the system waits for user's intervention before booting.
BMC IRQ	[IRQ 11] Disabled	Specify whether to allocate interrupt lines for BMC (Baseboard Management Controller).
Post Error Pause	Disabled [Enabled]	Specify whether to stop the POST once at the end of POST if an error occurs during the POST.
Memory Error	Halt [Boot]	Specify whether to stop operation at the end of POST processing if a memory resource error occurred while executing POST. This setting is enabled if **POST Error Pause** in the **Server** menu is enabled. Even if this option is set to **Boot**, operation stops at the end of POST if errors occurred for all resources.
Power Switch Inhibit	[Disabled] Enabled	Enable or disable the power switch inhibit feature.
Standby Power Save	[Disabled] Enabled	Enable or disable the feature that saves the standby power on standby. If this option is enabled, the **AC-LINK** setting is fixed to **Power On** and cannot be changed.
AC-LINK	Stay Off [Last State] Power On	Specify how the power state should be when the AC power is supplied again after loss of power. (See the table below)
Power On Delay Time Mode	[Manually Setting] Random	Select a method to specify the delay time before powering on DC power. Available options are: "User-specified value" or "random value". This option is selectable when **Power On** or **Last State** is specified in **AC-LINK**.
Power ON Delay Time	[xx]-600	Specify the waiting time before powering on DC within the range between **"xx"** and 600 seconds. This feature is enabled when **Power On** or **Last State** is specified in the AC LINK setting. **"xx"** indicates the minimum configurable time and is displayed when executing **Load Setup Defaults**. If **Save Changes and Exit** is selected with a value smaller than the minimum value specified, the minimum configurable time is automatically applied.
CLI SETUP	[Disabled] Enabled	When this option is set to **Enabled**, the BIOS Setup utility is run by the CLI SETUP (Command Line Interface SETUP Menu) instead of the **MENU SETUP**. To switch back to the **MENU SETUP**, set this option to **Disabled** in the **CLI SETUP** menu.

[ ]: Factory setting

The table below shows the operation when the AC power is turned off once and then back on, in accordance with the **AC LINK** setting.

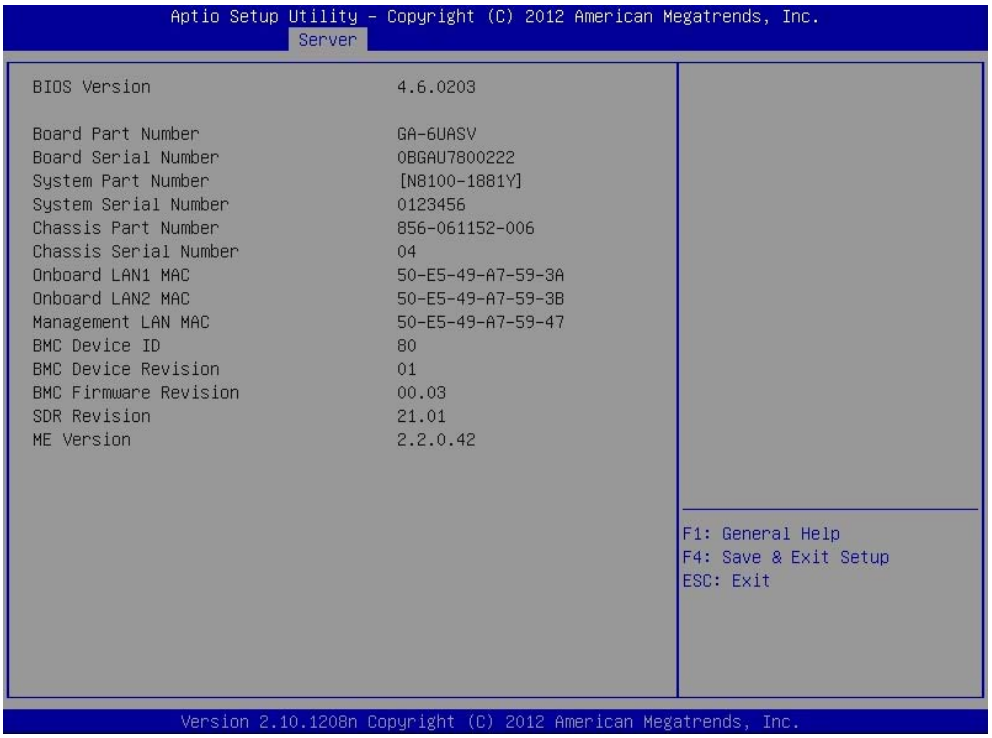
System status before AC power was turned off	AC LINK setting		
	Stay Off	Last State	Power On
Operating	Off	On	On
Abort (DC power is also Off)	Off	Off	On
Forced shutdown*	Off	On	On

* Continue pressing the POWER switch for at least 4 seconds to forcibly turn off the power.

Tips If an uninterruptible power supply (UPS) is used for automatic operation, set the **AC-LINK** to **Power On**.

(1) System Management submenu

From the **Server** menu, move the cursor to **System Management** and then press the <Enter> key to show its submenus.

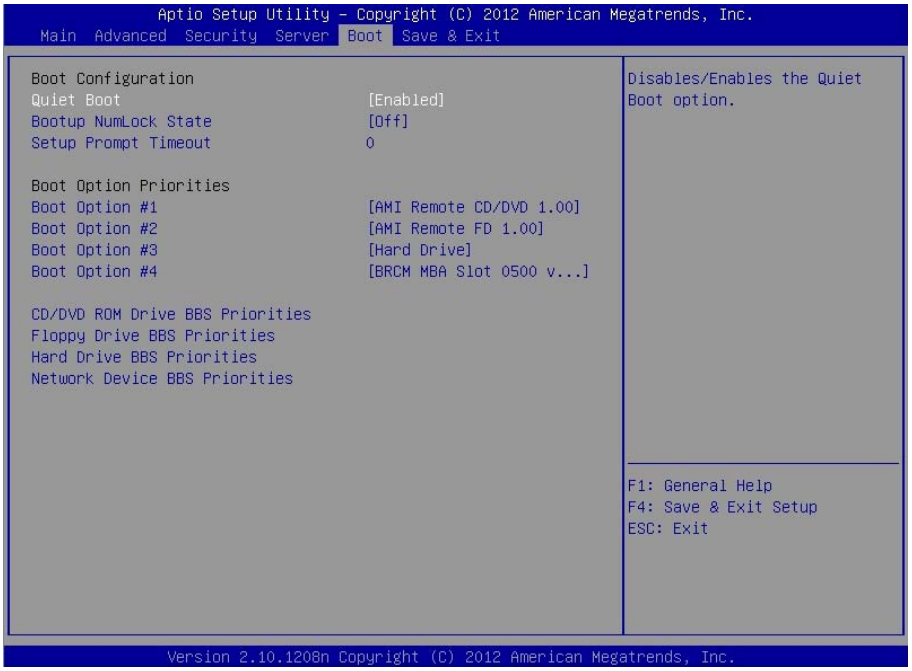

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Server
BIOS Version 4.6.0203
Board Part Number GA-6UASV
Board Serial Number 0BGAU7800222
System Part Number [N8100-1881Y]
System Serial Number 0123456
Chassis Part Number 856-061152-006
Chassis Serial Number 04
Onboard LAN1 MAC 50-E5-49-A7-59-3A
Onboard LAN2 MAC 50-E5-49-A7-59-3B
Management LAN MAC 50-E5-49-A7-59-47
BMC Device ID 80
BMC Device Revision 01
BMC Firmware Revision 00.03
SDR Revision 21.01
ME Version 2.2.0.42
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below (display only).

Option	Parameter	Descriptions
BIOS Version	–	Displays the current BIOS version.
Board Part Number	–	Displays the part number of the motherboard.
Board Serial Number	–	Displays the serial number of the motherboard.
System Part Number	–	Displays the part number of the system.
System Serial Number	–	Displays the serial number of the system.
Chassis Part Number	–	Displays the part number of the chassis.
Chassis Serial Number	–	Displays the serial number of the chassis.
Onboard LAN1 MAC	–	Displays the MAC address of the onboard LAN port 1.
Onboard LAN2 MAC	–	Displays the MAC address of the onboard LAN port 2.
Management LAN MAC	–	Displays the MAC address of the management LAN port.
BMC Device ID	–	Displays the BMC device ID.
BMC Device Revision	–	Displays the BMC device revision.
BMC Firmware Revision	–	Displays the BMC firmware revision.
SDR Revision	–	Displays the revision of the sensor data record.
ME Version	–	Displays the firmware version of Management Engine

1.2.5 Boot

If you move the cursor to **Boot**, the **Boot** menu where you can configure the boot order appears.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
Boot Configuration
Quiet Boot [Enabled]
Bootup NumLock State [Off]
Setup Prompt Timeout 0
Boot Option Priorities
Boot Option #1 [AMI Remote CD/DVD 1.00]
Boot Option #2 [AMI Remote FD 1.00]
Boot Option #3 [Hard Drive]
Boot Option #4 [BRCM MBA Slot 0500 v...]
CD/DVD ROM Drive BBS Priorities
Floppy Drive BBS Priorities
Hard Drive BBS Priorities
Network Device BBS Priorities
Disables/Enables the Quiet Boot option.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below.

Option	Parameter	Descriptions
Boot Configuration	–	–
Quiet Boot	Disabled [Enabled]	When this option is set to **Disabled**, the results of POST execution are displayed instead of the NEC logo after the power is turned on. If **BIOS Redirection Port** is enabled, this option is shown as Unavailable and inaccessible (the Quiet Boot feature is always disabled).
Bootup Numlock State	On [Off]	Enable or disable Numlock.
Setup Prompt Timeout	[0] Number	Specify the time (in seconds) until the <F2> is pressed to launch SETUP. The specified value is reflected to waiting time immediately before completion of POST.
Boot Option Priorities	–	–
Boot Option #1	–	These items display the priority of boot devices. If all of the Boot Options are set to **Disabled**, the SETUP starts running upon completion of POST.
Boot Option #2	–	
Boot Option #3	–	
Boot Option #4	–	
CD/DVD ROM Drive BBS Priorities	–	Specify the boot priority for each BBS.
Floppy Drive BBS Priorities	–	
Hard Drive BBS Priorities	–	
Network Drive BBS Priorities	–	

[ ]: Factory setting

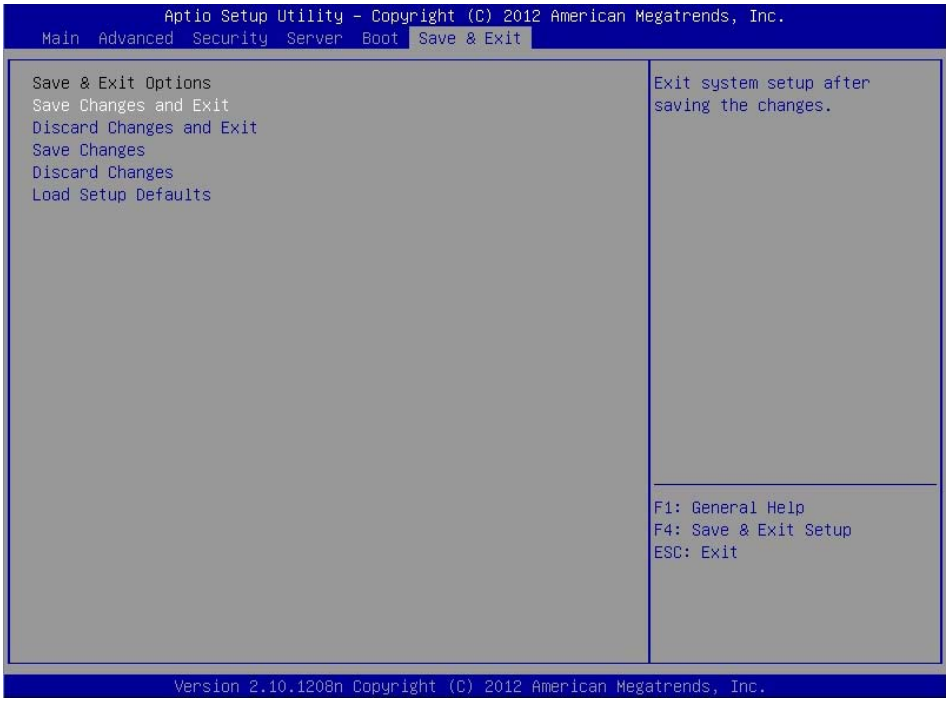
Tips

- If a bootable device is newly connected, the priority lowest in its BBS Priorities is assigned to that device.
- If a bootable device is disconnected from the server, the relevant device is removed from BBS Priorities.
- When **Load Setup Defaults** is executed on **Save & Exit** menu, the **Boot Option** and **BBS Priorities** are changed as follows.
  - Boot Option Priorities
    - Boot Option #1: CD/DVD ROM Drive
    - Boot Option #2: Floppy Drive
    - Boot Option #3: Hard Drive
    - Boot Option #4: Network Device
  - The priority of bootable devices in BBS Priorities are determined as follows:
    Devices other than USB device (e.g., SATA device, RAID): High
    USB device: Next to non-USB devices
  - If a bootable device has been set to **Disabled**, cancel the Disabled status, and register the device in **BBS Priorities**.
- If a Remote Management Extended License (*1) is registered, the remote media is added to bootable devices. The remote media is assigned as follows:
  - The highest priority within "CD/DVD ROM Drive BBS Priorities" is assigned to AMI Remote CD/DVD device.
  - When executing **Load Setup Defaults** in **Save & Exit** menu, the highest priority within "CD/DVD ROM Drive BBS Priorities" is assigned to AMI Remote CD/DVD device.

(*1) Refer to *EXPRESSSCOPE Engine 3 User's Guide* for details of Remote Management Extended License.

1.2.6 Save & Exit

If you move the cursor to **Save & Exit**, the **Save & Exit** menu appears.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
Save & Exit Options
Save Changes and Exit
Discard Changes and Exit
Save Changes
Discard Changes
Load Setup Defaults
Exit system setup after saving the changes.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.10.1208n Copyright (C) 2012 American Megatrends, Inc.

The options of this menu are described below.

(a) Save Changes and Exit

The SETUP utility closes with all the changes saved in NVRAM (Non-volatile RAM). After the SETUP utility closes, the system automatically reboots.

(b) Discard Changes and Exit

The SETUP utility closes without saving the changes and returns to the previous BIOS settings. After the SETUP utility closes, the system automatically reboots.

(c) Save Changes

Changes are saved in NVRAM.

(d) Discard Changes

The changes will be discarded and the values are reset to the previously set values.

(e) Load Setup Defaults

This option resets all values in the SETUP utility to the default settings.

Note The factory settings and default values may differ depending on the model. The settings must be corrected according to your environment by referring to the list of settings in this section.

2. Flash FDD

A Flash FDD is a device that is compatible with a floppy disk drive.

One Flash FDD can be connected to a USB connector of this server. If another USB or floppy disk drive is connected to this server, be sure to disconnect it.

CAUTION

Be extremely careful not to lose the Flash FDD or have it stolen.
If the Flash FDD is lost, stolen, misappropriated, or fraudulently obtained, there is a risk of leaking confidential information to a third party. NEC assumes no responsibility for damages caused by leaking confidential information in this way.

The status of the write protection switch on the Flash FDD applied is the status before connecting to this server. When you change the write protect switch, you have to disconnect the Flash FDD from the server, change the write protect switch, and then connect it again.

Tips Be careful not to accidentally flip the write protect switch while connecting the Flash FDD to or disconnecting it from the server.

2.1 Precautions

The Flash FDD is only intended as a temporary means of recording a driver, so do not use the FDD to back up data.

2.1.1 Compensation for recorded data

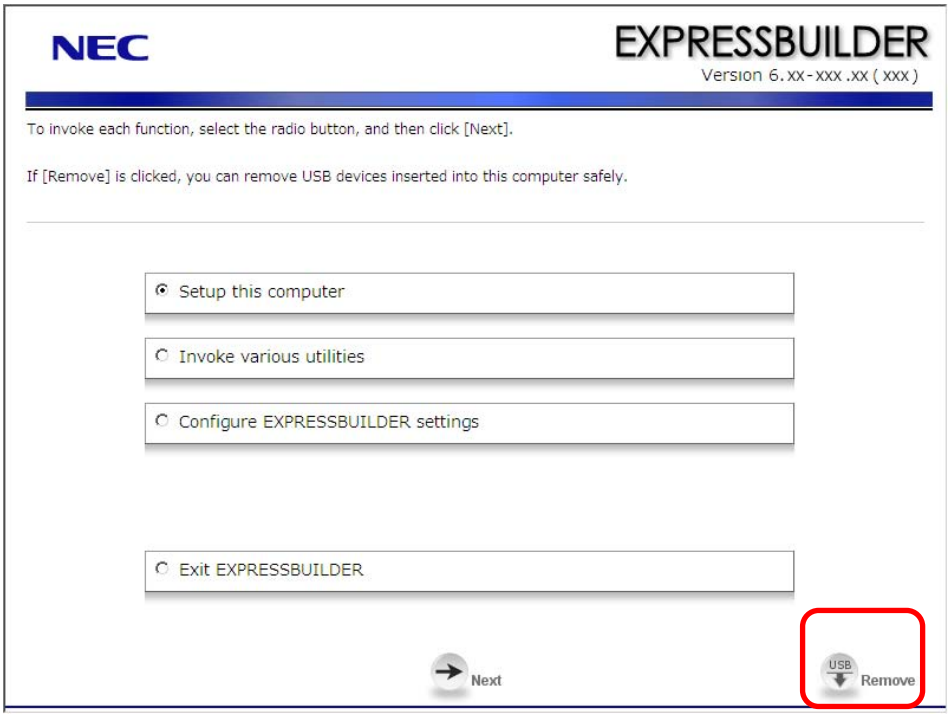
NEC will not pay compensation for data recorded on the Flash FDD if the data is lost.

2.1.2 Handling the Flash FDD

- Do not turn off the server while the access LED of the Flash FDD is blinking.
  Turning off the server at this time can cause a failure or data corruption.
- The Flash FDD is a consumable.
  If the Flash FDD causes an error, use a new Flash FDD.
- The Flash FDD cannot be connected by way of a USB hub. Directly connect the Flash FDD to a USB connector of the server.
- Before touching the Flash FDD, discharge static electricity from your body by touching a nearby metal object (such as a doorknob or aluminum frame).
- Do not disassemble the Flash FDD.
- Do not apply a strong force to the Flash FDD
- Do not place the Flash FDD in an area directly exposed to sunlight or near a heater.
- Do not handle the Flash FDD while eating, drinking, or smoking. Also, avoid contact with thinner, alcohol, or other corrosive substances.
- Carefully connect the Flash FDD to the server.
- Do not move the server while the Flash FDD is connected to the USB connector. Doing so could cause a failure.
- Remove the Flash FDD from the server after use.

2.1.3 Precautions when using EXPRESSBUILDER

- Connect the Flash FDD after the top menu is displayed.
- When you terminate EXPRESSBUILDER, disconnect the Flash FDD from the server first.
- Click [Remove] in the lower right corner of the menu to disable the Flash FDD, and then remove it.



3. Power Control Feature

Power consumption of the server can be controlled through the command line interface of EXPRESSSCOPE Engine 3 (BMC) or by using NEC ESMPRO Manager. This feature curves the upper limit of the power consumption, which allows more servers to be installed in the environment where the power consumption is limited.

For settings information, refer to "*EXPRESSSCOPE Engine3 User's Guide*" or *NEC ESMPRO Manager online help*.

3.1 Supported OS

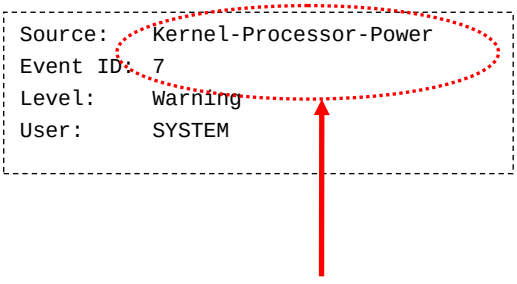
The power control feature is available for the following OSs.

OSs that support the power control feature

- Windows Server 2003 R2, Standard Edition (SP2 or later)
- Windows Server 2003 R2, Standard x64 Edition (SP2 or later)
- Windows Server 2008, Standard
- Windows Server 2008, Enterprise
- Windows Server 2008, Standard x64
- Windows Server 2008, Enterprise x64
- Windows Server 2008 R2, Standard x64
- Windows Server 2008 R2, Enterprise x64

3.2 Notes on Using Windows Server 2008

The event shown below may be logged in Event Viewer if power control feature is used on Windows Server 2008. However, it is the normal operation and the event is logged because the power is controlled by the server side.



Source: Kernel-Processor-Power
Event ID: 7 or 37

4. RAID System Configuration

This section describes the RAID configuration utility, the LSI Software RAID Configuration Utility.

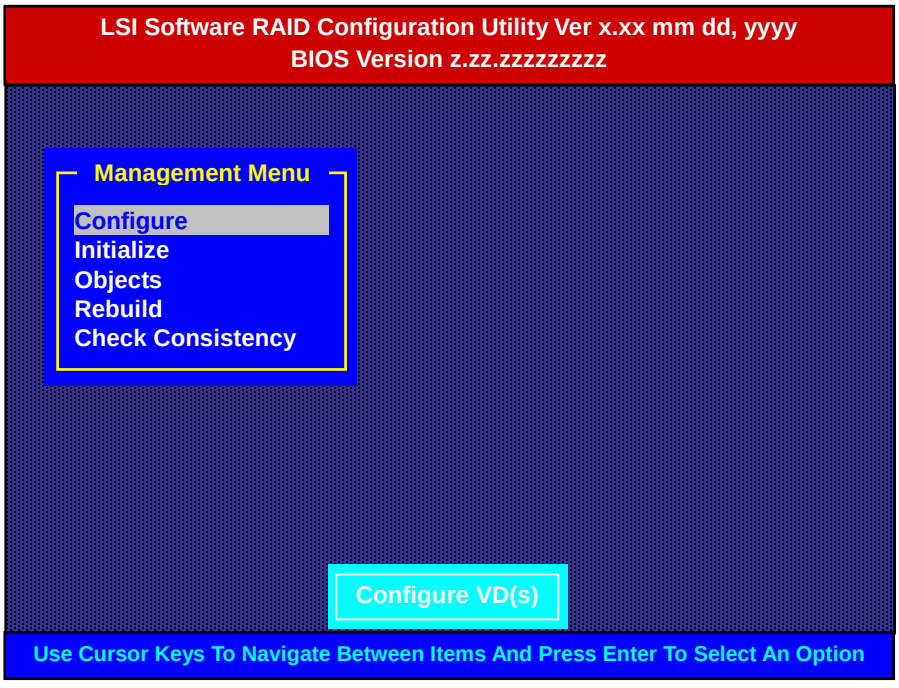
Because this utility resides in LSI Embedded MegaRAID, its operation is independent of the OS.

4.1 Running the LSI Software RAID Configuration Utility

When the message below appears on the POST screen after turning on the server, press the <Ctrl> + <M> keys or <Enter> key. The LSI Software RAID Configuration Utility starts.

```
Press Ctrl-M or Enter to run LSI Software RAID Configuration Utility
```

Tips If you failed to perform the key operation as described above and the following screen did not appear, restart the server and retry.



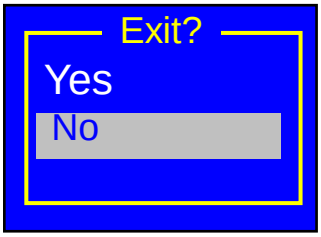
*1: In the menu screen shown above, x of `LSI Software RAID Configuration Utility Verx.xx` indicates the utility version.

*2: `mm dd, yyyy` indicates the date when the utility was created.

*3: `z` of `BIOS Version z.zz.zzzzzzzz` indicates the version of the LSI Software RAID BIOS.

4.1.1 Exiting the LSI Software RAID Configuration Utility

On the TOP menu of the LSI Software RAID Configuration Utility, press the <Esc> key.



When the confirmation message appears, select **Yes**.

When the following message appears, press <Ctrl> + <Alt> + <Delete>. The server restarts.

```
Press<CTRL><ALT><DEL> To Reboot The System
```

4.2 Menu Tree

◇: Selection and execution parameter ●: Setting parameter •: Data display

◆: Can be set or modified after a virtual drive is created

(1/2)

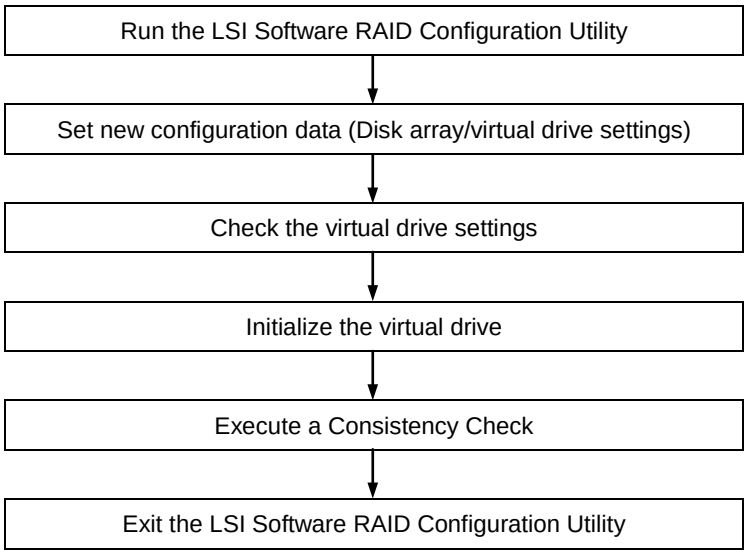
Menu	Description
◇Configure	Specify configuration settings
◇Easy Configuration	Set a configuration using fixed values
◇New Configuration	Set a new configuration
◇View/Add Configuration	Add or view a configuration
◇Clear Configuration	Clear the configuration data
◇Select Boot Drive	Select a virtual drive to be booted
◇Initialize	Initialize the virtual drive
◇Objects	Set up various objects
◇Adapter	Set up the RAID Controller
◇Sel. Adapter	Select an adapter
●Rebuild Rate	30
●Chk Const Rate	30
●FGI Rate	30
●BGI Rate	30
●Disk WC	Off
●Read Ahead	On
●Bios State	Enable
●Cont on Error	Yes
●Fast Init	Enable
●Auto Rebuild	On
●Auto Resume	Enable
●Disk Coercion	1 GB
●Factory Default	Reset to the default values
◇Virtual Drive	Operate a virtual drive
◇Virtual Drives	Select a virtual drive (when multiple virtual drives exist)
◇Initialize	Initialize the virtual drive
◇Check Consistency	Check virtual drive consistency
◇View/Update Parameters	View the virtual drive information
• RAID	View the RAID level
• SIZE	View the virtual drive capacity
• Stripe SIZE	View the stripe size
• #Stripes	View the number of Hard Disk Drives in the virtual drive
• State	View the virtual drive status
• Spans	View the span setting
• Disk WC	View the write cache setting
• Read Ahead	View the read ahead setting

(2/2)

Menu	Description
◇Physical Drive	Operate a Physical Drive
◇Physical Drive Selection Menu	Select a Physical Drive
◇Make HotSpare	Set a hot spare disk for auto rebuilding
◇Force Online	Forcibly place a Hard Disk Drive online
◇Change Drv State	Forcibly place a Hard Disk Drive in the virtual drive offline Cancel the setting of a hot spare Hard Disk Drive
◇Device Properties	View the Hard Disk Drive information
• Device Type	Device type
• Capacity	Capacity
• Product ID	Model
• Revision No.	Revision number
• Link Speed	Link speed
◇Rebuild	Perform rebuilding
◇Check Consistency	Check virtual drive consistency

4.3 LSI Software RAID Configuration Utility Operating Procedure

4.3.1 Creating and adding a configuration


Run the LSI Software RAID Configuration Utility
Set new configuration data (Disk array/virtual drive settings)
Check the virtual drive settings
Initialize the virtual drive
Execute a Consistency Check
Exit the LSI Software RAID Configuration Utility

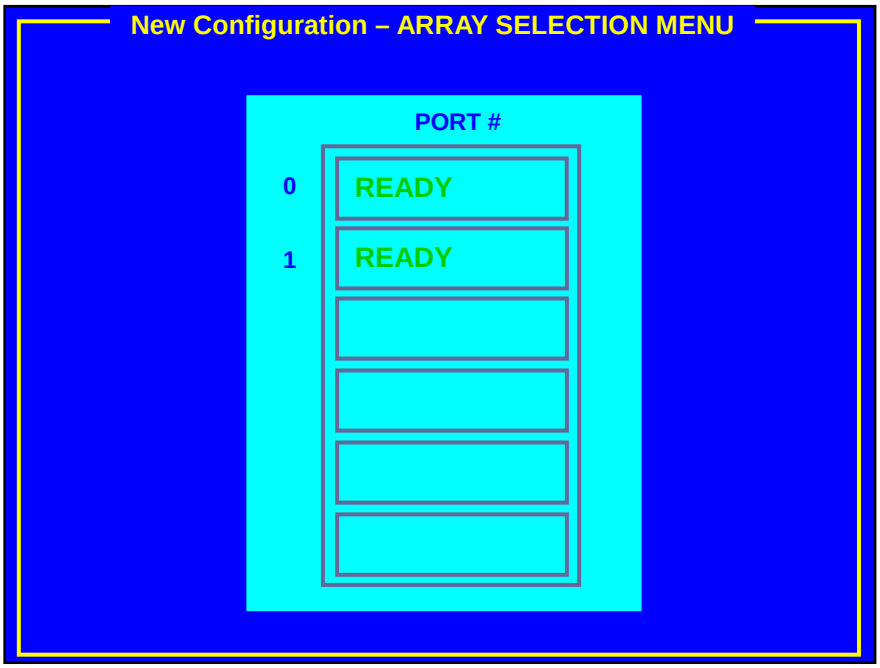
1. Run the LSI Software RAID Configuration Utility.
2. To create a new configuration, select **Configure** and then **New Configuration** from the TOP menu (**Management Menu**).
   To add a configuration, select **Configure** and then **View/Add Configuration**.

Important **When a configuration is created by selecting *New Configuration*, the existing configuration data is cleared. To add configuration data to the existing configuration, select *View/Add Configuration*.**

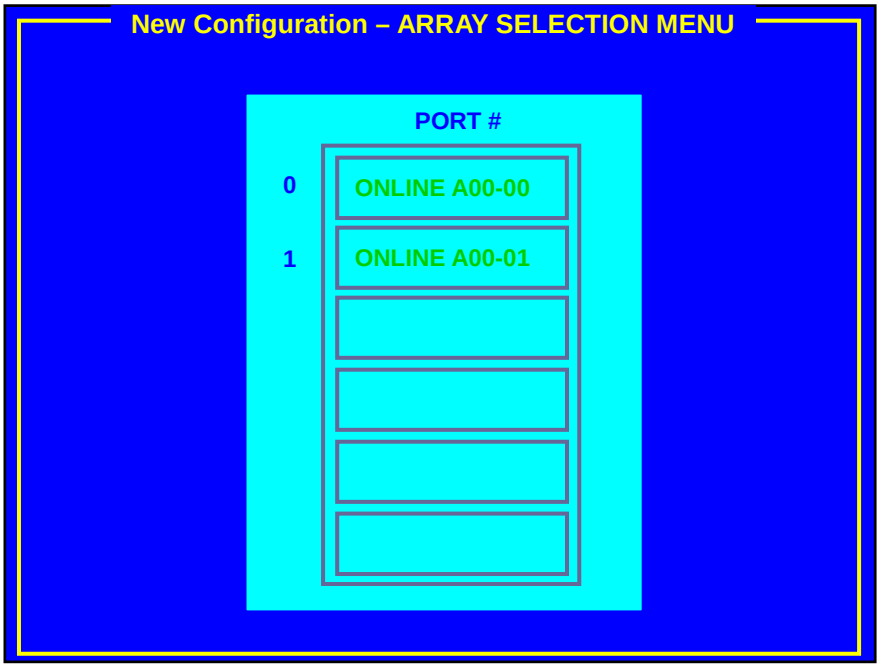
Note

- When **Easy Configuration** is selected to create a configuration, the virtual drive capacity cannot be specified. If you want to specify the capacity, select **New Configuration** or **View/Add Configuration**.
- For RAID10, the virtual drive capacity is set as the maximum capacity. You cannot specify a capacity.
- For RAID0, skip **Check Consistency**.

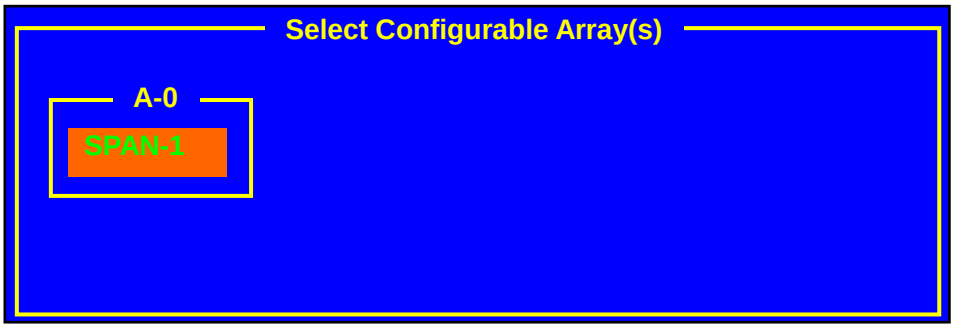
3. When the confirmation message "Proceed?" appears, select **Yes**.
   The New Configuration - ARRAY SELECTION MENU screen appears.



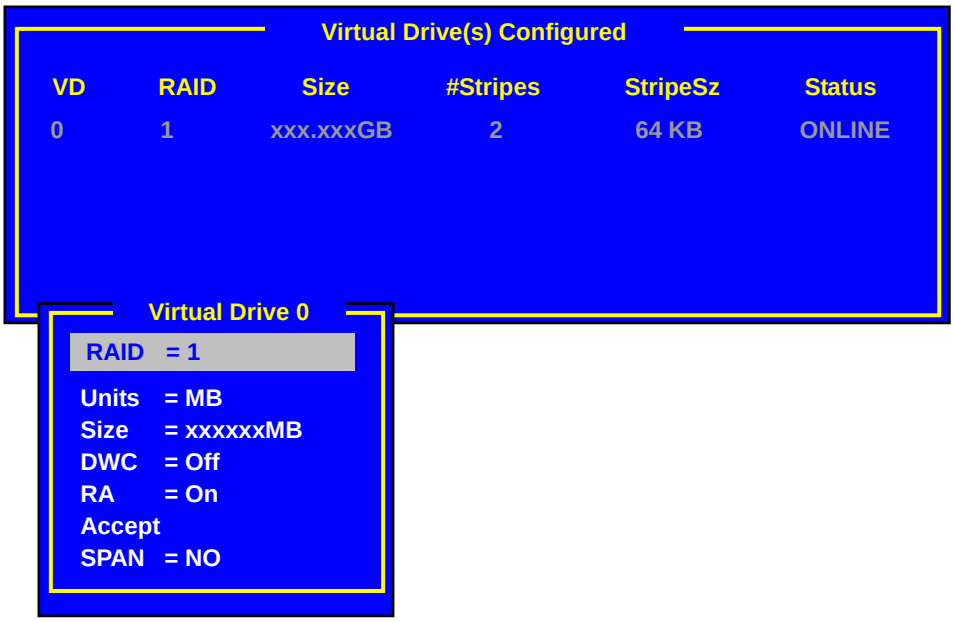
4. Use the cursor keys to move the cursor to the Hard Disk Drive to be configured as array disk, and then press the space key.
   The Hard Disk Drive is selected. On the screen, the selected Hard Disk Drive status changes from **READY** to **ONLINE**.



5. Press the <F10> key to specify **Select Configurable Array(s)**, and then press the space key.
   SPAN-1 is set.



6. Press the <F10> key to create a virtual drive.
   The Virtual Drive(s) Configured screen is displayed. The following screen shows an example of RAID1 consisting of two Hard Disk Drives. On this screen, xxx.xxxGB indicates the capacity.



7. Use the cursor keys to move the cursor to **RAID**, **Size**, **DWC**, **RA**, or **Span**.
   Press the <Enter> key while the target parameter is highlighted to specify its setting.

   (1) **RAID**: Specify the RAID level.

Parameter	Remarks
0	RAID0
1	RAID1
10	RAID10

   The selectable RAID level varies depending on the number of Hard Disk Drives configuring the disk array.

Important **Although *RAID5* is displayed if three or more Hard Disk Drives are configured, this server does not support RAID5.**

   (2) **Units**: Specify the units of the virtual drive capacity specified by **Size** (MB, GB, or TB).

   (3) **Size**: Specify the virtual drive capacity. Up to eight virtual drives can be created. For RAID10, the virtual drive capacity cannot be specified.

   (4) **DWC**: Specify the disk write cache.

Parameter	Remarks
Off	Write through
On*	Write back

*Recommended

   * Considering the performance, **On** (write back) is recommended for this server. Note, however, cache data might be lost in the case of unexpected power failure when **On** is specified.
   When **Off** is selected, the performance is lowered to 50% or less compared with when **On** is selected.

   (5) **RA**: Specify whether to perform read ahead.

Parameter	Remarks
Off	Do not perform read ahead
On*	Perform read ahead

*Recommended

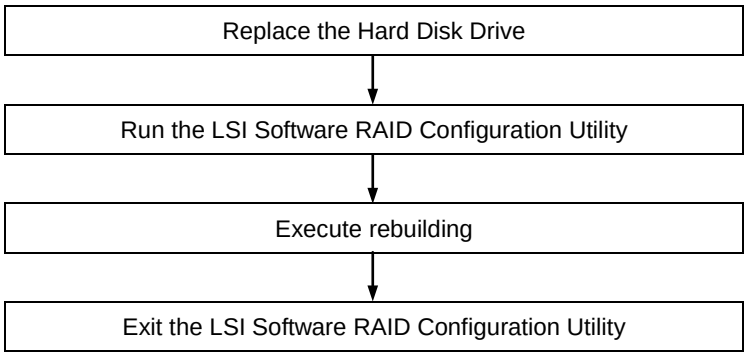
   (6) **Span**: Specify the span setting.

   This parameter is not used for this server.

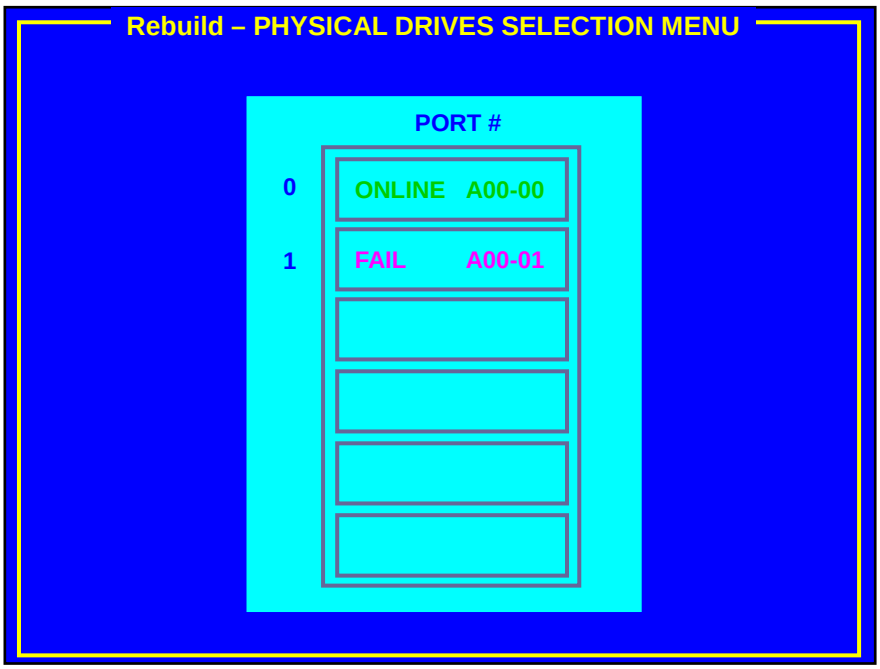
8. When all settings are specified, select **Accept** and then press the <Enter> key.
9. Press the <ESC> key to close the screen. When the message "Save Configuration?" appears, select **Yes**.
   The configuration is saved.
10. Press the <Esc> key to return to the TOP menu screen.
11. On the TOP menu screen, select **Objects**, **Virtual Drive**, and then **View/Update Parameters** to check the virtual drive information.
12. Press the <Esc> key to return to the TOP menu screen, and then select **Initialize**.
13. On the Virtual Drives screen, use the cursor keys to move the cursor to the virtual drive to be initialized, and then press the space key.
    The virtual drive is selected.
14. Press the <F10> key.
    When the initialization confirmation message appears, select [Yes].
    Initialization of the selected virtual drive starts.
    Initialization completes when the **Completed** progress bar on the Init Of VD Is In Progress screen reaches 100%. Press the <Esc> key to return to the TOP menu screen.
15. For RAID1 and RAID10, execute a Consistency Check for the virtual drive after initialization completes.
    For details about how to execute a Consistency Check, refer to *Chapter 2 (4.3.4 Executing a Consistency Check*).
16. Press the <Esc> key to return to the TOP menu screen, and then exit the LSI Software RAID Configuration Utility.

Important **Be sure to execute a Consistency Check after creating a configuration.**

4.3.2 Executing rebuilding manually

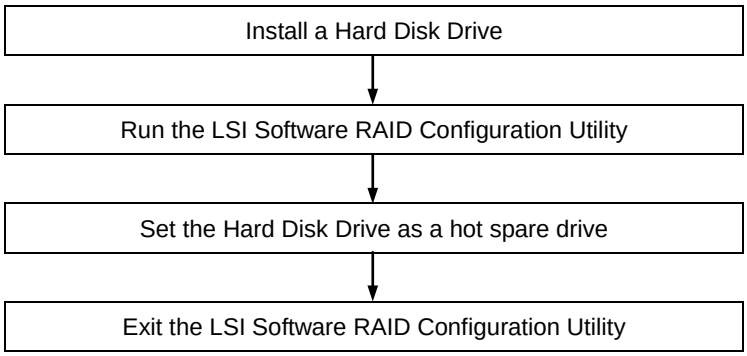

Replace the Hard Disk Drive
Run the LSI Software RAID Configuration Utility
Execute rebuilding
Exit the LSI Software RAID Configuration Utility

1. Replace the Hard Disk Drive and turn on the server.
2. Run the LSI Software RAID Configuration Utility.
3. Select **Rebuild** from the TOP menu.
   The Rebuild - PHYSICAL DRIVES SELECTION MENU screen appears.

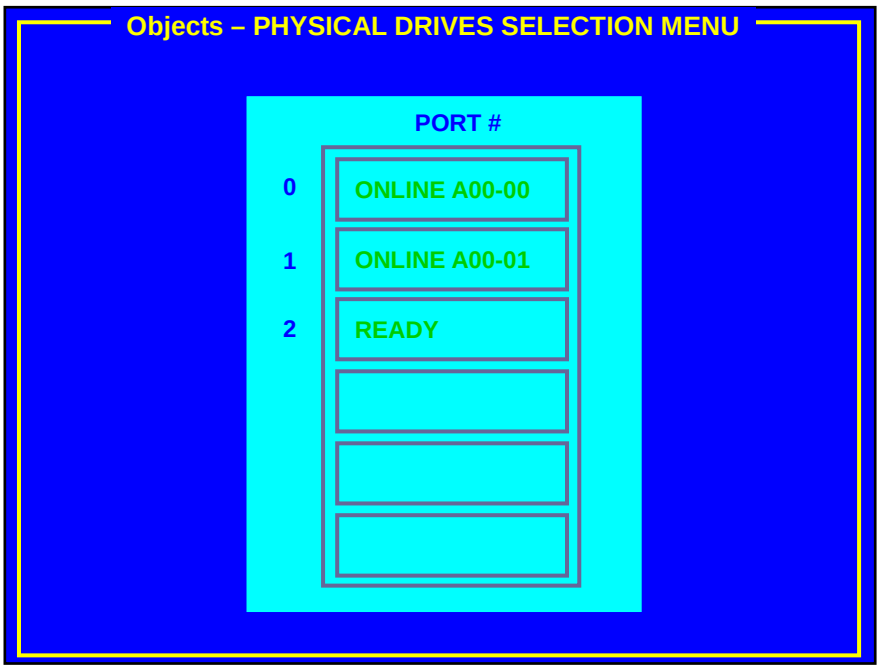


4. Move the cursor to a Hard Disk Drive indicated by **FAIL** to be rebuilt, and then press the space key to select it.
   The character of the selected drive turns pink.
5. Press the <F10> key to execute rebuilding.
6. When the confirmation message appears, select **Yes**.
   Rebuilding of the selected drive starts.
   Rebuilding completes when the **Completed** progress bar on the REBUILDING screen reaches 100%.
7. Press the <Esc> key to return to the TOP menu screen, and then exit the LSI Software RAID Configuration Utility.

4.3.3 Setting a hot spare Hard Disk Drive

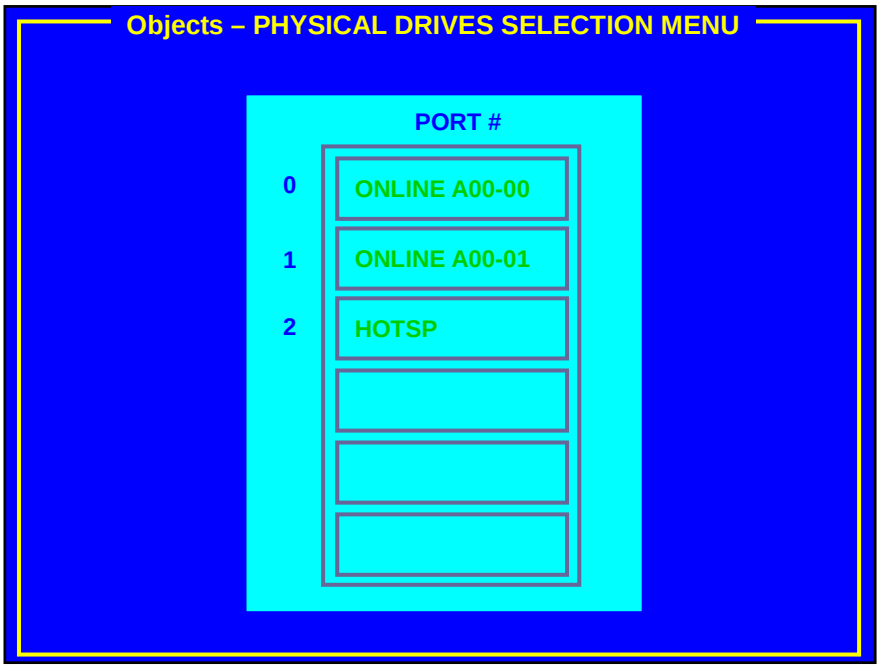

Install a Hard Disk Drive
Run the LSI Software RAID Configuration Utility
Set the Hard Disk Drive as a hot spare drive
Exit the LSI Software RAID Configuration Utility

1. Install a Hard Disk Drive to be used as a hot spare drive, and then turn on the server.
2. Run the LSI Software RAID Configuration Utility.
3. From the TOP menu, select **Objects** and then **Physical Drive**.
   The Objects - PHYSICAL DRIVE SELECTION MENU screen appears.



4. Move the cursor to the Hard Disk Drive to be used as a hot spare drive, and then press the <Enter> key.
5. When the selection dialog box appears, select **Make HotSpare**.
6. When the confirmation message appears, select **Yes**.
   Indication of the Hard Disk Drive specified as a hot spare drive changes to **HOTSP**.

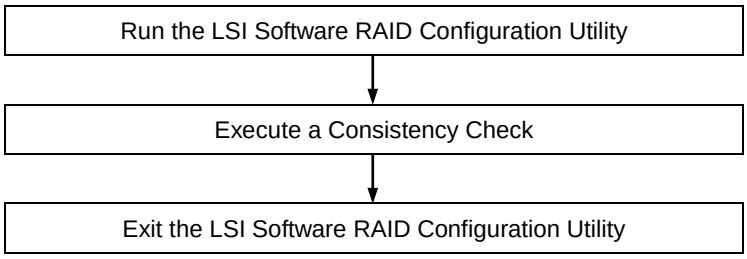
7. Press the <Esc> key to return to the TOP menu screen, and then exit the LSI Software RAID Configuration Utility.



Note

- To cancel the hot spare setting, select **Objects** and then **Physical Drive** from the TOP menu. Next, move the cursor to the Hard Disk Drive to cancel the hot spare setting, press the <Enter> key, and then select **Change Drv State**.
- If two or more Hard Disk Drives (with the same capacity) are assigned as a hot spare drive, rebuilding is executed from the drive that has a smaller port number.

4.3.4 Executing a Consistency Check


Run the LSI Software RAID Configuration Utility
Execute a Consistency Check
Exit the LSI Software RAID Configuration Utility

1. Run the LSI Software RAID Configuration Utility.
2. Select **Check Consistency** from the TOP menu.
   The Virtual Drives screen appears.
3. Move the cursor to the Hard Disk Drive to be checked for consistency, and then press the space key to select it. The virtual drive is selected.
4. Press the <F10> key.
5. When the confirmation message for execution appears, select [Yes] to start a Consistency Check.
   The Consistency Check completes when the **Completed** progress bar on the CC Under Progress screen becomes 100%.
6. Press the <Esc> key to return to the TOP menu screen, and then exit the LSI Software RAID Configuration Utility.

Important

- **Be sure to execute a Consistency Check after creating a configuration.**
- **Do not execute a Consistency Check for RAID0.**

4.3.5 Other functions

(1) Clear Configuration

Clears the configuration data. From the TOP menu, select **Configure** and then **Clear Configuration**. When **Clear Configuration** is executed, all the configuration data on the RAID Controller and Hard Disk Drives is cleared.

If the old configuration data is remained in hard disk drive, configuration may fail. In this case, execute **Clear Configuration**.

Note

To delete the configuration data of a virtual drive, select **Objects** and then **Virtual Drive** from the TOP menu. Next, move the cursor to the virtual drive to be deleted, and then press the <Delete> key. When the confirmation message "Want To Delete A VD?" appears, select **Yes**.

(2) Force Online

Forcibly places a failed Hard Disk Drive online.
From the TOP menu, select **Objects** and then **Physical Drive**. Next, select the drive to be placed online, and then select **Force Online**.

(3) Rebuild Rate

Specifies the rebuilding rate.
From the TOP menu, select **Objects**, **Adapter**, and then **Rebuild Rate**.
The setting range is 0 to 100%. The default value is 30% (recommended).

(4) Viewing Hard Disk Drive information

Displays information about a Hard Disk Drive.
From the TOP menu, select **Objects** and then **Physical Drive**. Next, select the drive whose information you want to view, and then select **Drive Properties**.

4.4 LSI Software RAID Configuration Utility and Universal RAID Utility

Universal RAID Utility is available as a utility to configure, manage, and monitor the LSI Embedded MegaRAID after the operating system starts.

The points to be noted when using the Universal RAID Utility together with the LSI Software RAID Configuration Utility are described below.

(1) Terms

Some terms are different between the LSI Software RAID Configuration Utility and Universal RAID Utility. When using the Universal RAID Utility together with the LSI Software RAID Configuration Utility, replace the terms as shown in the table below:

Terms of LSI Software RAID Configuration Utility	Terms of Universal RAID Utility	
	RAID Viewer	raidcmd
Adapter	RAID Controller	RAID Controller
Virtual disk	Logical Drive	Logical Drive
Array	Disk Array	Disk Array
Physical Drive	Physical Device	Physical Device

Tips `raidcmd` is a command provided by the Universal RAID Utility. For details, refer to "*Universal RAID Utility User's Guide*".

(2) Management numbers

The numbers indicating RAID Controller information differ between the LSI Software RAID Configuration Utility and Universal RAID Utility as shown in the table below.

For details about the differences in management numbers, refer to "*Universal RAID Utility User's Guide*".

Item	Management Number	
	LSI Software RAID Configuration Utility	Universal RAID Utility
Adapter (RAID Controller)	Starts from 0	Starts from 1
Virtual drive (Logical Drive)	Starts from 0	Starts from 1
Array (Disk Array)	Starts from 0	Starts from 1
Physical Drive (Physical Device)	Starts from 0	To be assigned based on an enclosure that contains the physical device and its slot number.

(3) Priority specification

For setting and displaying the priority of the Rebuild and Consistency Check for the RAID Controller, the LSI Software RAID Configuration Utility uses numerical values while the Universal RAID Utility uses three levels of high, middle, and low. The table below shows the correspondence between the numerical value ranges and levels for each item.

- Correspondence between the setting values for the LSI Software RAID Configuration Utility and the display levels for the Universal RAID Utility

Item	Setting values of the LSI Software RAID Configuration Utility	Display levels of the Universal RAID Utility
Rebuild priority **Rebuild Rate** (LSI Software RAID Configuration Utility)	15 to 100	High
	8 to 14	Middle
	0 to 7	Low
Consistency Check priority **Chk Const Rate** (LSI Software RAID Configuration Utility)	15 to 100	High
	8 to 14	Middle
	0 to 7	Low

- Values to be set when changing the level with the Universal RAID Utility

Item	Selection levels of the Universal RAID Utility	Setting values
Rebuild priority **Rebuild Rate** (LSI Software RAID Configuration Utility)	High	20
	Middle	10
	Low	5
Consistency Check priority **Chk Const Rate** (LSI Software RAID Configuration Utility)	High	20
	Middle	10
	Low	5

Tips

- The LSI Software RAID Configuration Utility can specify **FGI** (foreground initialization) and **BGI Rate** (background initialization priority), but the Universal RAID Utility cannot specify the background initialization priority.
- The Universal RAID Utility can specify the initialization priority, except for the LSI MegaRAID. Therefore, no parameter for specifying the initialization priority is provided on the Option tab in the RAID Viewer properties.

4.5 WebBIOS and Universal RAID Utility

As a utility to configure, manage, and monitor the RAID System after the operating system starts, Universal RAID Utility is available. The points to be noted when using the Universal RAID Utility together with the WebBIOS are described below.

(1) Terms

Some terms are different between the WebBIOS and Universal RAID Utility. When using the Universal RAID Utility together with the WebBIOS, replace the terms as shown in the table below:

Terms of WebBIOS	Terms of Universal RAID Utility	
	RAID Viewer	raidcmd
Adapter	RAID Controller	RAID Controller
Virtual drive	Logical Drive	Logical Drive
Drive group	Disk Array	Disk Array
Drive	Physical Device	Physical Device

Tips `raidcmd` is a command provided by the Universal RAID Utility. For details, refer to "*Universal RAID Utility User's Guide*".

(2) Management numbers

The numbers indicating RAID Controller information differ between the WebBIOS and Universal RAID Utility as shown in the table below.

For details about the differences in management numbers, refer to "*Universal RAID Utility User's Guide*".

Item	Management Number	
	WebBIOS	Universal RAID Utility
Adapter (RAID Controller)	Starts from 0	Starts from 1
Virtual drive (Logical Drive)	Starts from 0	Starts from 1
Drive group (Disk Array)	Starts from 0	Starts from 1
Drive (Physical Device)	Starts from 0	To be assigned based on an enclosure that contains the physical device and its slot number.

(3) Priority specification

For setting and displaying the priority of the background tasks (Rebuild, Patrol Read, and Consistency Check) for the RAID Controller, the WebBIOS uses numerical values while the Universal RAID Utility uses three levels of high, middle, and low. The table below shows the correspondence between the numerical value ranges and levels for each item. In this case, the priority is the percentage of the background task processing to all processes being processed by the RAID Controller.

- Correspondence between the setting values for the WebBIOS and the display levels for the Universal RAID Utility

Item	Setting values of the LSI Software RAID Configuration Utility	Display levels of the Universal RAID Utility
Rebuild priority	80 to 100	High
	31 to 79	Middle
	0 to 30	Low
Patrol Read priority	80 to 100	High
	31 to 79	Middle
	0 to 30	Low
Consistency Check priority	80 to 100	High
	31 to 79	Middle
	0 to 30	Low

- Values to be set when changing the level with the Universal RAID Utility

Item	Selection levels of the Universal RAID Utility	Setting values
Rebuild priority	High	90
	Middle	50
	Low	10
Patrol Read priority	High	90
	Middle	50
	Low	10
Consistency Check priority	High	90
	Middle	50
	Low	10

Tips

- The WebBIOS can specify the background initialization priority, but the Universal RAID Utility cannot.
- Although the Universal RAID Utility can specify the priority of initialization (Slow Initialize), this server does not support this function.

4.6 SuperBuild Utility and Universal RAID Utility

Universal RAID Utility is available as a utility to configure, manage, and monitor the RAID System after the operating system starts. The points to be noted when using the Universal RAID Utility together with the SuperBuild Utility are described below.

(1) Terms

Some terms are different between the SuperBuild Utility and Universal RAID Utility. When using the Universal RAID Utility together with the SuperBuild Utility, replace the terms as shown in the table below:

Terms of SuperBuild Utility	Terms of Universal RAID Utility	
	RAID Viewer	raidcmd
Controller	RAID Controller	RAID Controller
Logical Drive	Logical Drive	Logical Drive
Disk Array	Disk Array	Disk Array
Physical Drive	Physical Device	Physical Device

Tips `raidcmd` is a command provided by the Universal RAID Utility. For details, refer to "*Universal RAID Utility User's Guide*".

(2) Control numbers

The numbers indicating RAID Controller information differ between the SuperBuild Utility and Universal RAID Utility as shown in the table below.

For details about the differences in control numbers, refer to "*Universal RAID Utility User's Guide*".

Item	Control Number	
	SuperBuild Utility	Universal RAID Utility
Controller (RAID Controller)	Starts from 1	Starts from 1
Logical Drive	Starts from 0	Starts from 1
Disk Array	Starts from 0	Starts from 1
Physical Drive (Physical Device)	Starts from 1	To be assigned based on an enclosure that contains the physical device and its slot number.

5. Details of EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows and check the server. Bundled software and documents are provided in EXPRESSBUILDER.

5.1 Storage Media

EXPRESSBUILDER can be operated from the following two ways.

Tips Remove other removable media before starting EXPRESSBUILDER.

DVD:

EXPRESSBUILDER DVD is supplied as standard. This is used in the following two ways:

(1) Insert the DVD to the optical disk drive of the server, and then restart the system by turning off and on the server or by pressing <Ctrl> + <Alt> + <Delete> keys.

Boot Selection Menu shown in *Chapter 2 (5.2 Menu) - (1) Boot Selection Menu* then appears.

(2) Insert the DVD into a computer on which Windows is running.

Autorun Menu shown in *Chapter 2 (5.2 Menu) - (4) Autorun Menu* then appears.

Internal Flash Memory (optional):

If Internal Flash Memory is installed in the server, EXPRESSBUILDER can be started from it.

Note It is necessary to copy EXPRESSBUILDER to the Internal Flash Memory first. For details, refer to *(2) Manage* in *Chapter 2 (5.4 Configure EXPRESSBUILDER Settings)*.

Press <F3> key when the following message appears on POST screen. At this time, **be sure to remove a bootable disc from the optical disk drive**.

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

If <F3> Internal Flash Memory is not displayed on POST screen, make sure that Internal Flash Memory is connected correctly by referring to a) in *Chapter 2 (5.4 Configure EXPRESSBUILDER Settings) - (2) Manage Internal Flash Memory*.

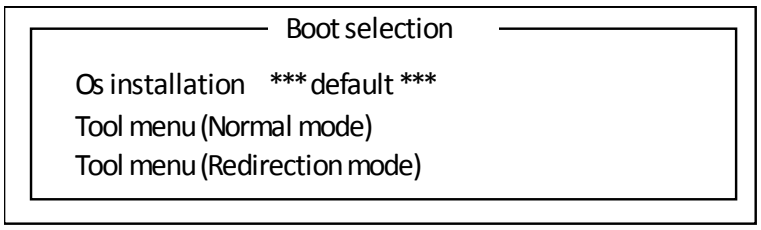
When EXPRESSBUILDER is started from Internal Flash Memory, Boot Selection Menu shown in *Chapter 2 (5.2 Menu) - (1) Boot Selection Menu* appears.

5.2 Menu

EXPRESSBUILDER is operated by using onscreen menus.

(1) Boot Selection Menu

When EXPRESSBUILDER starts from DVD or Internal Flash Memory, Boot Selection Menu shown below appears.



Use the upper and lower arrow keys to move the cursor, and then press <Enter> key to select it.

Os installation (default) is selected if no key is pressed.

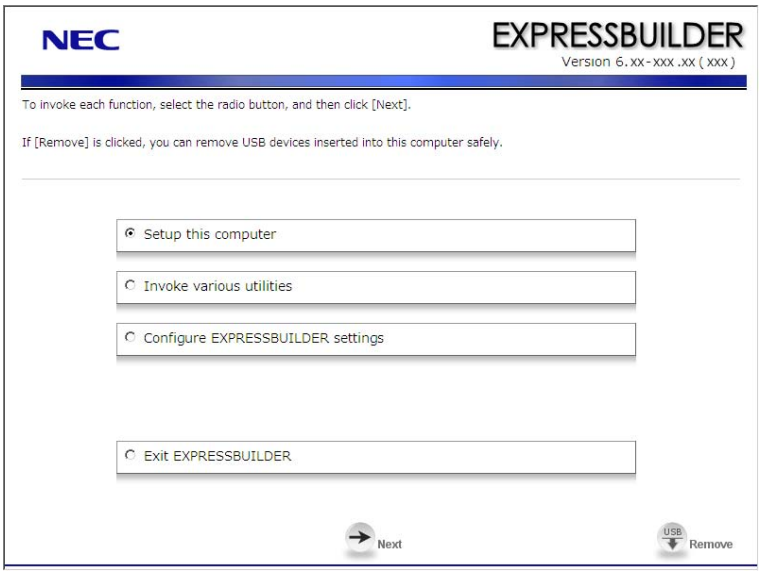
If **Os installation** is selected, Top menu shown in *(2) Top menu* appears after confirmation of Windows PE software license.

If **Tool menu (Normal mode)** is selected, Tool Menu shown in *(3) Tool Menu* appears. The screen appears on the display. Select this mode normally.

If **Tool menu (Redirection mode)** is selected, you can operate EXPRESSBUILDER remotely by using BIOS Console Redirection. In this mode, the menu items and the tools that can be activated are the same as those in normal mode.

Tips Be sure to select normal mode when using the remote KVM feature.

(2) Top Menu


NEC
EXPRESSBUILDER
Version 6.xx-xxx.xx (xxx)
To invoke each function, select the radio button, and then click [Next].
If [Remove] is clicked, you can remove USB devices inserted into this computer safely.
Setup this computer
Invoke various utilities
Configure EXPRESSBUILDER settings
Exit EXPRESSBUILDER
Next
Remove

Tips EXPRESSBUILDER is a configuration tool and it uses Windows PE. Note that EXPRESSBUILDER automatically restarts if it is operated continuously 72 hours.

Operate Top Menu using the mouse or keyboard.

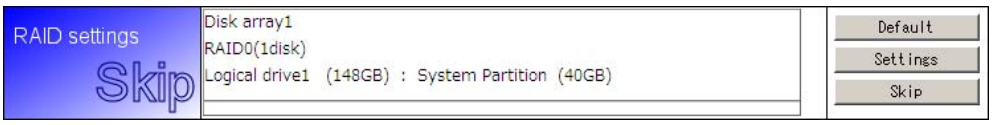
The following menus are included.

a) Set up this computer

RAID configuration and Windows installation can be performed. For details about how to install an OS, refer to "*Installation Guide (Windows)*".

Configure RAID System only

If **Configure RAID System only** is selected, only creation and modification of the RAID System is performed. Install an OS separately after setting up the RAID configuration.



- Click [Default] to reset the RAID configuration to the default values.
- Click [Settings] to launch the setup wizard and set up the RAID configuration by following the instructions on the screen.
- Click [Skip] to cancel the RAID configuration setup.

b) Invoke various utilities

Start a utility provided by EXPRESSBUILDER.

For details about the provided utilities, refer to *Chapter 2 (5.3 Utilities Provided by EXPRESSBUILDER)*.

c) Configure EXPRESSBUILDER settings

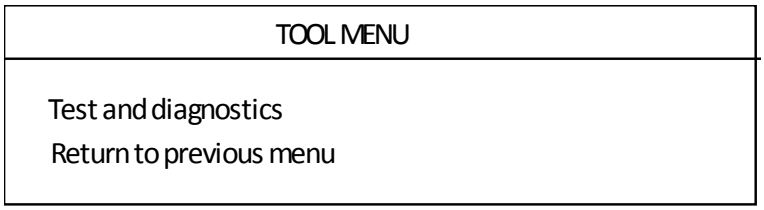
Specify EXPERSSBUILDER settings. For details about the settings, refer to *Chapter 2 (5.4 Setting Up EXPRESSBUILDER Operating Environment)*.

d) Exit EXPRESSBUILDER

Select this item to exit EXPRESSBUILDER.

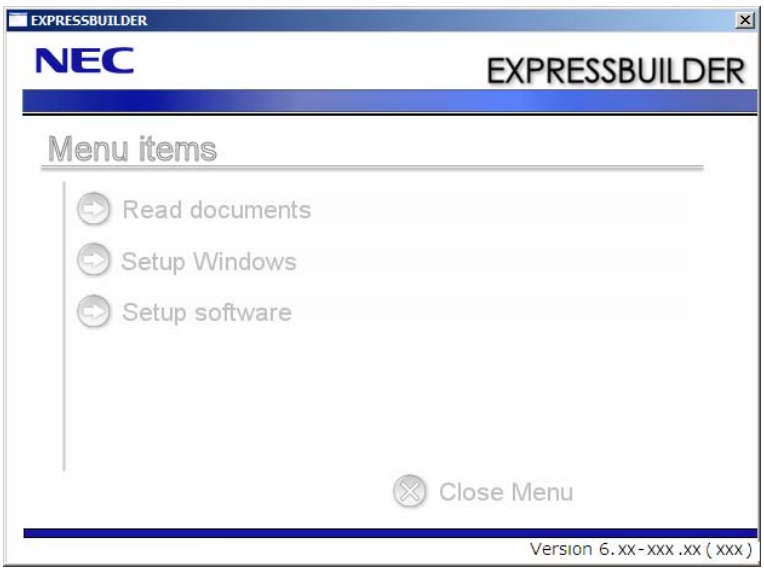
Click **Remove** icon on the lower right to safely remove the USB device connected to the server.

(3) Tool Menu



The system diagnostics, which is used to analyze and diagnose the server and check the connection, can be started from Tool Menu. For details about system diagnostics, refer to *Chapter 1 (8. System Diagnostics)*.

(4) Autorun Menu



Documents can be read and bundled software can be installed from Autorun Menu. Adobe Reader is needed to view or print documents because all documents are provided as PDF files.

If Autorun Menu does not launch, eject the DVD and then insert it again. Autorun Menu can be re-displayed by selecting **Computer**(this is **My Computer on XP)** from Windows Explorer and then double-clicking the drive icon of EXPRESSBUILDER DVD.

Tips The menu item **Create drivers disk** is not provided for this version. A driver disk for Windows can be created as required during the steps of **Set up this computer**.

5.3 Utilities Provided by EXPRESSBUILDER

The following utilities can be started when you select **Invoke various utilities** from Top menu (described in *Chapter 2 (5.2 Menu) - (2) Top menu*):

(1) Install Starter Pack to installed Windows

Installs Starter Pack to the installed Windows. Starter Pack contains drivers customized to this server. Be sure to install Starter Pack before operating this server.

Note If EXPRESSBUILDER is launched from DVD, this feature is disabled. You can install Starter Pack according to *Chapter 2 (5.2 Menu - (4) Autorun Menu)*.

Tips Starter Pack is automatically installed when Windows is installed by using EXPRESSBUILDER.

(2) Save or restore RAID configuration data

Saves and restores the configuration data on the RAID Controller.

The data can be saved to Internal Flash Memory if installed.

(3) Run a file directly

Directly starts an external utility stored in removable media. **Use this function only for utilities provided by NEC**.

Note The operation of external utilities provided by companies other than NEC is not guaranteed.

5.4 Configure EXPRESSBUILDER Settings

EXPRESSBUILDER settings can be configured when you select **Configure EXPRESSBUILDER settings** from Top Menu (described in *Chapter 2 (5.2 Menu) - (2) Top Menu*), as follows.

(1) Load a driver into EXPRESSBUILDER

A driver stored in removable media can be loaded. **Use this function only for drivers provided by NEC**.

Note The operation of drivers that are provided by companies other than NEC is not guaranteed.

(2) Manage Internal Flash Memory

Internal Flash Memory can be managed by using commands described below.

Note The below commands are not available when EXPRESSBUILDER is started from Internal Flash Memory.

a) Confirm the connection of Internal Flash Memory

Checks if Internal Flash Memory is installed and accessible.

POST message is changed depending on the execution result of this command.

If the connection of Internal Flash Memory is recognized, the commands **b)** and **c)** below can be executed.

Connected: EXPERSSBUILDER can be started by pressing <F3> key (<F3> `Internal Flash Memory` is displayed on the screen).

Not connected: EXPERSSBUILDER cannot be started by pressing <F3> key (<F3> `Internal Flash Memory` is not displayed on the screen).

b) Initialize Internal Flash Memory

Clears the data in Internal Flash Memory and initializes (formats) it.

Be careful that **all data in Internal Flash Memory is deleted**.

c) Update Internal Flash Memory

Copies EXPRESSBUILDER from EXPRESSBUILDER DVD or other media provided by NEC to Internal Flash Memory.

The data is overwritten and **all previous data is cleared**.

Tips The parameter file and RAID configuration data are retained.

6. EXPRESSSCOPE Engine 3

The EXPRESSSCOPE Engine 3 enables various functions by using a system management LSI called BMC (Baseboard Management Controller).

The EXPRESSSCOPE Engine 3 monitors statuses inside the server such as that of power supplies, fans, temperature, and voltage. Connecting the management LAN port to your network enables you to do the following from a remote site via a Web browser and SSH client;

- Managing the server
- Operating* KVM (keyboard, video, and mouse) from a remote console
- Accessing* a CD-ROM, DVD ROM, floppy disk, ISO image, or USB flash drive in a remote console

* In order to activate these functions, the optional N8115-04 Remote KVM and Media License Key are required.
To actualize these functions, a USB mass storage device (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is virtually connected.

Note

(If N8115-04 Remove KVM and Media License if installed)

More than one removable drives other than the actual drive are displayed on the operating system of the host system. This is a normal operation and these added removable drives are the virtual removable drives reserved for the remote media function of EXPRESSSCOPE Engine 3 (*1).

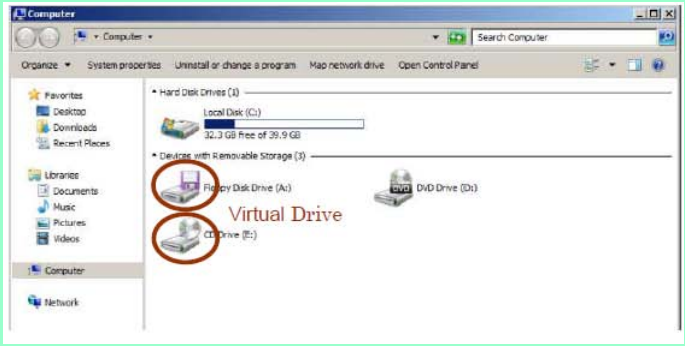


Fig. 1 Exp. Windows Server 2008 R2 Computer Folder (*2)

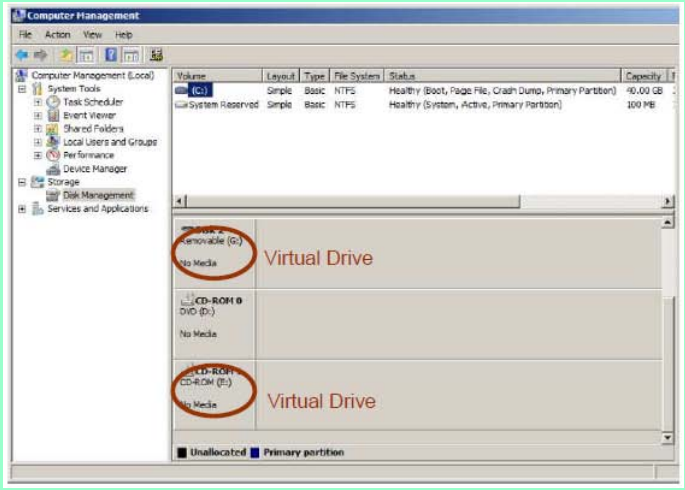


Fig. 2 Exp. Windows Server 2008 R2 Server Manager (*2)

*1 A function to use FD/CD/DVD drives, ISO images and USB memories connected to the management PC as drives virtually connected to the host system.

*2 The number of drives and the drive character are different depending on system configurations.

7. NEC ESMPRO

7.1 NEC ESMPRO Agent (for Windows)

For details of NEC ESMPRO Agent(for Windows), refer to "*NEC ESMPRO Agent Installation Guide (Windows)*" in EXPRESSBUILDER or its help.

7.2 NEC ESMPRO Manager

NEC ESMPRO Manager can remotely control and monitor the hardware and RAID System of the server.
To use these features, install the designated bundle software such as NEC ESMPRO Agent on the server.

For the operating environment, precautions for use, and detailed settings for NEC ESMPRO Manager, refer to "*NEC ESMPRO Manager Installation Guide*" or online help.

7.3 NEC ESMPRO Agent Extension

NEC ESMPRO Agent Extension allows you to manage this server remotely by this server's BMC connecting with NEC ESMPRO Manager.

For precautions and details about setting of NEC ESMPRO Agent Extension, refer to "*NEC ESMPRO Agent Extension Installation Guide*" on the NEC EXPRESSBUILDER DVD.

7.4 BMC Configuration

BMC Configuration enables you to specify configuration information to this server's BMC.

For precautions and details about setting of BMC Configuration, refer to "*BMC Configuration User's Guide*" on the NEC EXPRESSBUILDER DVD.

7.5 NEC ExpressUpdate Agent

NEC ExpressUpdate Agent enables you to manage and update the versions of the firmware and software installed in this server.

By using NEC ESMPRO Manager, you can download update packages automatically and install them easily.

For precautions and details about setting of NEC ExpressUpdate Agent, refer to "*NEC ExpressUpdate Agent Installation Guide*" on the NEC EXPRESSBUILDER DVD.

Important Updates are available for some firmware and software that do not support NEC ExpressUpdate. Refer to the following website to install these packages:
http://www.nec.com/global/prod/express/index.html

8. NEC Product Info Collection Utility

NEC Product Info Collection Utility can collect various information related to the server all at once. This utility allows you to collect server information(Product Info) for maintenance.

8.1 Usage

Execute `\stdclct\collect.exe` contained in the installation folder of this utility.

(By default, this utility has been installed to the **C:\ezclct** folder.)

The `log` folder is created in `stdclct` folder and “Product Info” is stored in a compressed (zip) file.

Tips

- Log on to Windows with an account that has an administrator privilege.
- The installation drive requires a free space of at least 2.5 GB.

9. Universal RAID Utility

Universal RAID Utility is an application to manage or monitor the following RAID Controllers.

- On-board RAID Controller (LSI Embedded MegaRAID)
- N8103-128 RAID Controller (128 MB, RAID 0/1)
- N8103-149 RAID Controller (512MB, RAID 0/1)
- N8103-150 RAID Controller (512MB, RAID 0/1/5/6)
- N8103-151 RAID Controller (1GB, RAID 0/1/5/6)

For information about installing Universal RAID Utility, refer to Universal RAID Utility in "*Installation Guide (Windows)*".

Refer to "*Universal RAID Utility User's Guide*" in the attached EXPRESSBUILDER for more information about operating instructions and functions.

9.1 Easy Configuration Function

You cannot use the Easy Configuration with LSI Embedded MegaRAID.

9.2 Creating Logical Drive of RAID 6

You must use four or more Physical Devices to create a RAID 6 Logical Drive by using Universal RAID Utility. If you want to create a RAID 6 Logical Drive from three Physical Devices, you need to use WebBIOS.

NEC Express5800 Series
Express5800/GT110e-S

3 Appendix

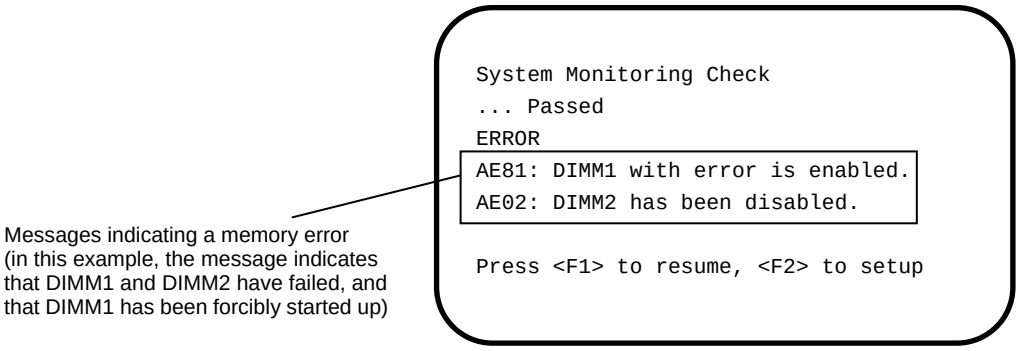
1. **POST Error Message**
   Shows a list of error messages for errors detected by a self diagnostic test called *POST*.

2. **List of Windows Event Logs**
   Shows a list of Windows event logs

3. **Accessing Data for Electrical Power, Temperature, and Processor Utilization**
   Describes how to check power consumption in watts, intake temperature, and logical processor utilizations.

1. POST Error Message

When an error is detected by POST, which is executed after the server is turned on, the display shows an error message. In addition, depending on the error contents, the computer might beep to report that an error occurred.


System Monitoring Check
... Passed
ERROR
AE81: DIMM1 with error is enabled.
AE02: DIMM2 has been disabled.
Press <F1> to resume, <F2> to setup
Messages indicating a memory error
(in this example, the message indicates
that DIMM1 and DIMM2 have failed, and
that DIMM1 has been forcibly started up)

The following table lists error messages and the actions to take in response to them.

Tips

- **Write down the displayed messages and beep patterns before contacting a maintenance service company. Alarm messages are useful information for maintenance.**
- **The list only contains messages for the server. For details about error messages for optional devices, and the actions to take, refer to the manuals that come with each product.**

(1) Error messages

(1/3)

Error Message		Description	Recommended Action
8000	System variable is corrupted.	BIOS setup information is invalid.	Start the setup utility, and then execute **Load Setup Defaults** and specify the necessary settings. If the same error continues to occur, contact your service representative.
8002	Check date and time settings	The real-time clock time setting is incorrect.	Start the setup utility, and then specify the correct date and time. If the same error continues to occur, contact your service representative.
8006	System configuration data cleared by Jumper.	The setup utility settings were cleared using the jumper.	Follow the procedures described in *Chapter 1 (7. Resetting and Clearing the Server).*
8007	SETUP Menu Password cleared by Jumper.	The setup utility password was cleared using the jumper.	
8020	BIOS update error.	BIOS update failed.	Try BIOS update again. If it fails again, contact your service representatives.
9000	Unsupported CPU detected	An unsupported CPU was detected.	Contact your service representative.
9E80	Forced to use CPU with error.	A CPU error occurred.	
AE01	DIMM1 has been disabled.	A memory error occurred. DIMM1 has been disabled.	
AE02	DIMM2 has been disabled.	A memory error occurred. DIMM2 has been disabled.	
AE03	DIMM3 has been disabled.	A memory error occurred. DIMM3 has been disabled.	
AE04	DIMM4 has been disabled.	A memory error occurred. DIMM4 has been disabled.	
AE81	DIMM1 with error is enabled.	An error in DIMM1 occurred, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE82	DIMM2 with error is enabled.	An error in DIMM2 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
B000	Expansion ROM not initialized	There is no space for expanding option ROM.	If the board is not used as a boot device, disable the Option ROM Scan for that board.
B001	Expansion ROM not initialized - PCI Slot 1	Option ROM expansion in PCI slot 1 failed.	If the board is not used as a boot device, disable the Option ROM Scan for that board.
B002	Expansion ROM not initialized - PCI Slot 2	Option ROM expansion in PCI slot 2 failed.	
B003	Expansion ROM not initialized - PCI Slot 3	Option ROM expansion in PCI slot 3 failed.	
B004	Expansion ROM not initialized - PCI Slot 4	Option ROM expansion in PCI slot 4 failed.	
B022	Serial Port Configuration Overlapped.	Overlapping serial port configuration was detected.	Start up the setup utility, select **Advanced** → **Serial Port Configuration**, and specify the setting again in a way that the values of Base I/O or Interrupt in **Serial Port A** and **Serial Port B** will not be the same.

(2/3)

Error Message		Description	Recommended Action
C000	The error occurred during fan sensor reading.	An error occurred during fan sensor reading.	Contact your service representative.
C001	Fan 1 Alarm occurred.	An abnormality occurred in Fan 1.	It is possible that a fan has failed or is clogged Contact your service representative and request repairs.
C002	Fan 2 Alarm occurred.	An abnormality occurred in Fan 2.	
C003	Fan 3 Alarm occurred.	An abnormality occurred in Fan 3.	
C004	Fan 4 Alarm occurred.	An abnormality occurred in Fan 4.	
C005	Fan 5 Alarm occurred.	An abnormality occurred in Fan 5.	
C010	The error occurred during temperature sensor reading	An error occurred while reading the temperature sensor.	Contact your service representative.
C011	System Temperature out of the range.	A temperature abnormality was detected.	It is possible that a fan has failed or is clogged. Contact your service representative and request repairs.
C020	The error occurred during voltage sensor reading.	An error occurred while reading the voltage sensor.	Contact your service representative.
C021	System Voltage out of the range.	A system voltage abnormality was detected.	
C040	SROM data read error	SROM data reading error	
C061	1st SMBus device Error detected.	An error occurred in the 1st SM Bus.	
C062	2nd SMBus device Error detected.	An error occurred in the 2nd SM Bus.	
C063	3rd SMBus device Error detected.	An error occurred in the 3rd SM Bus.	
C064	4th SMBus device Error detected.	An error occurred in the 4th SM Bus.	
C065	5th SMBus device Error detected.	An error occurred in the 5th SM Bus.	
C066	6th SMBus device Error detected.	An error occurred in for the 6th SM Bus.	
C067	7th SMBus device Error detected.	An error occurred in the 7th SM Bus.	
C068	8th SMBus device Error detected.	An error occurred in the 8th SM Bus.	
C103	BMC core hardware failure.	BMC device (chip) error	Turn off the power, wait for about 30 seconds, and restart the server. If this does not resolve the problem, contact your service representative.
C104	BMC IBF or OBF check failed.	Accessing the BMC address failed.	
C105	BMC SEL area full.	There is not enough capacity to write the system event log.	Start up the offline tools and delete the event logs.
C10C	BMC update firmware corrupted.	BMC device (chip) error	Turn off the power, wait for about 30 seconds, and restart the server. If this does not resolve the problem, contact your service representative.
C10D	Internal Use Area of BMC FRU corrupted.	Failure of the SROM for storing chassis information	

(3/3)

Error Message		Description	Recommended Action
C10E	BMC SDR Repository empty.	BMC device (chip) error	Turn off the power, wait for about 30 seconds, and restart the server. If this does not resolve the problem, contact your service representative.
C10F	IPMB signal lines do not respond.	SMC (Satellite Management Controller) failure	
C110	BMC FRU device failure.	Failure of the SROM for storing chassis information	
C111	BMC SDR Repository failure.	Failure of the SROM for storing sensor data record information	
C112	BMC SEL device failure.	BMC device (chip) failure	
C113	BMC RAM test error.	BMC RAM error	
C114	BMC Fatal hardware error.	BMC error	
C11B	BMC Mezzanine card is not found.	BMC Mezzanine card is not mounted.	Contact your service representative.
C11C	BMC Mezzanine partition is invalid.	BMC Mezzanine partition is invalid.	
C200	The error occurred during memory configuration check.	The memory information could not be obtained.	Turn off the power and restart the server. If this does not resolve the problem, contact your service representative.
C201	Memory Configuration change is detected.	The memory configuration has changed since the previous startup.	When **Check previous system Config** is enabled in **server** of the setup, this message appears if the configuration was changed since the previous startup. If this message appears even when no configuration change has been made, contact your service representative.
C202	The error occurred during CPU configuration check.	The CPU information could not be obtained.	Turn off the power and restart the server. If this does not resolve the problem, contact your service representative.
C203	CPU Configuration change is detected.	The CPU configuration has changed since the previous startup.	When **Check previous system Config** is enabled in **server** of the setup, this message appears if the configuration was changed since the previous startup. If this message appears even when no configuration change has been made, contact your service representative
C300	Out-of-band setup configuration failure	Invalid access to BMC Mezzanine card	Contact your service representative.
C301	SDR mismatch error	Inconsistency in the hardware information of the sensor data record was detected	Contact your service representative.

(2) Error reporting via beep

Even if an error is detected by POST, the error message may be unable to be displayed in the display. In this case, the computer beeps to report that an error has occurred.

For example, the beep interval 1-3-3-1 indicates 1 beep, a pause, 3 beeps, a pause, 3 beeps, a pause, and 1 beep, which means that an error occurred while checking the memory capacity.

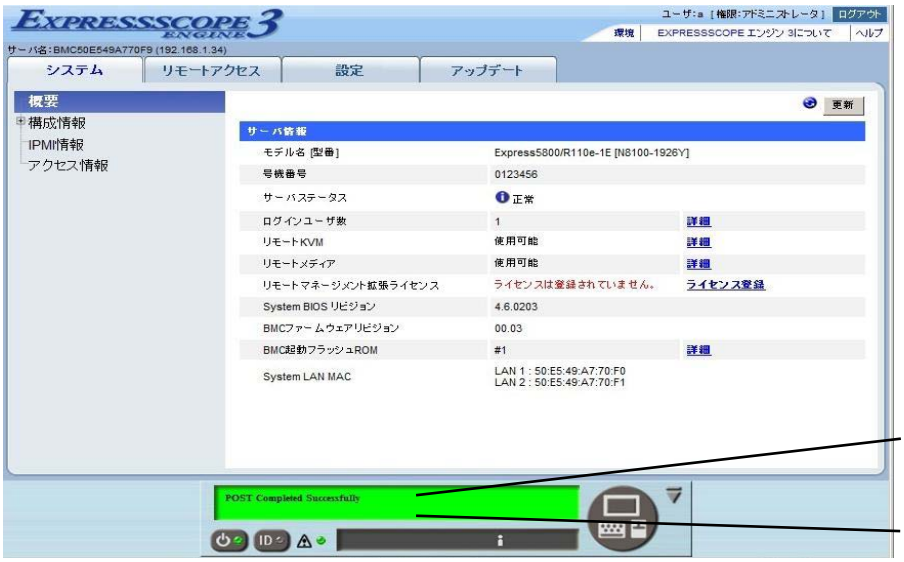
The table below shows the beep code, description, and recommended action.

Beep Code	Description	Recommended Action
1-3-3-1	No memory could be detected. An error occurred during a memory capacity check.	Make sure that the DIMMs are correctly inserted. If this does not resolve the problem, contact your service representative and request either a DIMM or motherboard replacement.
1-5-2-1	The processor is not installed.	Make sure that the processor is correctly mounted. If this does not resolve the problem, contact your service representative and request either a processor or motherboard replacement.
1-1	No graphics controller could be detected.	Contact your service representative and request a motherboard replacement.
1	An error occurred during the POST processing.	Contact your service representative and request a motherboard replacement.
3	Failed to read the BIOS executable module. Or, BIOS has no executable module.	Contact your service representative and request a motherboard replacement.
4	Failed to initialize the BIOS executable module.	Contact your service representative and request a motherboard replacement.
7	Failed to reset the system.	Contact your service representative and request a motherboard replacement.

(3) Error messages on a virtual LCD

In the EXPRESSSSCOPE Engine 3 (BMC) web browser window, you can confirm virtual LCD error messages (for details on the virtual LCD, refer to "*EXPRESSSSCOPE Engine 3 User's Guide*").

The table below shows the error messages displayed on upper and lower lines, the error contents, and actions taken for the errors.



- **Messages displayed on an upper LCD line**

(1/2)

BIOS Message on Upper LCD Line	Description	Action
`XX BIOS Rev XXXX`	POST in progress.	Wait until POST completes.
`POST Completed Successfully`	POST completes normally.	Wait until booting up completes.
`No Available Memory in System`	No available memory is implemented.	Make sure that the memory is correctly implemented.
`Memory Reconfigured`	A failed DIMM was detected and degraded.	Run SETUP, select **Advanced** → **Memory Configuration** → **Memory Retest**, and change parameter to **Yes**. Then, select **Save & Exit** → **Save Changes and Exit** and restart the server. If the same error persists, remove DIMM and install it again. If it does not resolve your problem, contact your sales representative.
`Error Pause in POST`	An error occurred during POST.	Check the error message which appears on-screen, and take the appropriate action for each error.
`POST ERROR XXXX`	Error XXXX was detected during POST.	Check the error message which appears on-screen, and take the appropriate action for each error.
`Entering BIOS SETUP MENU`	Starting up BIOS SETUP MENU.	This message will disappear when SETUP operation is completed.
`Waiting for normal temperature`	A temperature abnormality was detected inside the server.	Lower the room temperature or turn off the power to cool the server to room temperature before starting up the server. If this abnormality continues to occur, check if a fan has failed. If the same error still continues to occur, contact your representative.
`BIOS Updater Running`	BIOS update is in progress.	Wait until BIOS update is completed.

(2/2)

BIOS Message on Upper LCD Line	Description	Action
System Configuration change is detected	The CPU or memory configuration has changed since the previous startup.	If this message appears even when no configuration change has been made, contact your service representative
PCI Bus System Error x (x: 1-7)	A system error occurred in the PCI bus x.	Contact your service representative.
PCI Bus Parity Error x (x: 1-7)	A parity error occurred in the PCI bus x.	
PCI Slot #x Correctable Error (x: 1-4)	A correctable error occurred for PCI slot #x.	The error was corrected. You may continue operating the server. If the same error occurs after restart, re-install PCI card. If it does not solve your problem, contact your service representative.
PCI Slot #x Uncorrectable Error (x: 1-4)	An uncorrectable error occurred for PCI slot #x.	Re-install PCI card. If it does not solve your problem, contact your service representative.
PCI-Express Correctable Error x (x: 1-2)	A correctable device error occurred for PCI Express.	The error was corrected. You may continue operating the server. If the same error occurs after restart, contact your service representative.
PCI-Express Uncorrectable Error x (x: 1-2)	An uncorrectable device error occurred for PCI Express.	Contact your service representative.
DIMM #x Correctable Error (x: 1-4)	A correctable memory error occurred in DIMM #x.	The error was corrected. You may continue operating the server. If the same error occurs after restart, re-install DIMM. If it does not solve your problem, contact your service representative.
DIMM #x Uncorrectable Error (x: 1-4)	An uncorrectable memory error occurred in DIMM #x.	Re-install DIMM. If it does not solve your problem, contact your service representative.

- **Messages displayed on a lower LCD line**

(1/3)

BMC Message on Lower LCD Line	Description	Action
Processor Voltage Lower Non-Critical	A voltage abnormality was detected.	Contact your service representative.
Processor Voltage Upper Non-Critical		
Processor Voltage Lower Critical		
Processor Voltage Upper Critical		
BaseBoard Voltage Lower Non-Critical		
BaseBoard Voltage Upper Non-Critical		
BaseBoard Voltage Lower Critical		
BaseBoard Voltage Upper Critical		
VBAT Lower Non-Critical		
VBAT Upper Non-Critical		
VBAT Lower Critical		
VBAT Upper Critical		
Baseboard Temperature1 Lower Non-Critical	A temperature abnormality was detected.	It is possible that a fan has failed or is clogged. Contact your service representative and request repairs.
Baseboard Temperature1 Upper Non-Critical		
Baseboard Temperature1 Lower Critical		
Baseboard Temperature1 Upper Critical		
Baseboard Temperature2 Lower Non-Critical		
Baseboard Temperature2 Upper Non-Critical		
Baseboard Temperature2 Lower Critical		
Baseboard Temperature2 Upper Critical		
DIMM Area Temperature Lower Non-Critical		
DIMM Area Temperature Upper Non-Critical		
DIMM Area Temperature Lower Critical		
DIMM Area Temperature Upper Critical		

(2/3)

BMC Message on Lower LCD Line	Description	Action
Processor Thermal Control Upper Non-Critical	A temperature abnormality was detected.	It is possible that a fan has failed or is clogged. Contact your service representative and request repairs.
Processor Thermal Control Upper Critical		
DUMP Request !	The dump button was pressed.	Wait until collecting the memory dump data has finished.
OS shutdown Alm	An OS stop error occurred.	Record the displayed message, wait until collecting the memory dump data has finished, and then contact your service representative and request repairs.
Power Supply Failure detected	A power supply unit abnormality occurred.	Make sure that the power cord is plugged in. If this does not resolve the problem, contact your service representative and request repairs.
Processor Missing	No CPU is installed.	Contact your service representative and request CPU or motherboard replacement.
Processor Thermal Trip	The power was forcibly turned off due to a CPU temperature abnormality.	Contact your service representative.
DIMM1 Uncorrectable Error	An unrecoverable error occurred for DIMM1.	
DIMM2 Uncorrectable Error	An unrecoverable error occurred for DIMM2.	
DIMM3 Uncorrectable Error	An unrecoverable error occurred for DIMM3.	
DIMM4 Uncorrectable Error	An uncorrectable error occurred for DIMM4.	
Processor Internal Error	An internal CPU error (IERR) occurred.	
Sensor Failure Detected.	Abnormality in a sensor was detected.	
SMI timeout	A timeout occurred while servicing system management interrupts.	
IPMI Watchdog timer timeout (Power off)	A watchdog timer timeout occurred.	
Node Manager Firmware Image execution Failed	Abnormality in Node Manager occurred.	Turn off the power, wait for about 30 seconds, and restart the server. If this does not resolve the problem, contact your service representative.
Node Manager Firmware Flash Erase Error		
Node Manager Firmware Flash Corrupted		
Node Manager Firmware Flash Corrupted		
Node Manager Internal Error		

(3/3)

BMC Message on Lower LCD Line	Description	Action
Node Manager can't communicate BMC	Abnormality in Node Manager occurred.	Turn off the power, wait for about 30 seconds, and restart the server. If this does not resolve the problem, contact your service representative.
Node Manager Firmware Image execution Failed		
Node Manager Firmware Flash Erase Error		
Node Manager Firmware Flash Corrupted		
Node Manager Internal Error		
Node Manager can't communicate BMC		
Node Manager Manufacturing Error		
Node Manager Persistent Storage Integrity Error		
Drive 0 Fault	Operation was performed during Hard Disk Drive failure	
Drive 1 Fault		
Drive 2 Fault		
Drive 3 Fault		
Drive 4 Fault		
Drive 5 Fault		
System FAN1 Lower Non-Critical	A fan alarm was detected.	It is possible that a fan has failed or is clogged. Contact your service representative and request repairs.
System FAN2 Lower Non-Critical		
System FAN3 Lower Non-Critical		
System FAN4 Lower Non-Critical		
System FAN5 Lower Non-Critical		
System FAN6 Lower Non-Critical		

2. List of Windows Event Logs

OS

Event Log

ID	Source	Type	Message (Description)
	Timing		Action

All Windows OS

System Event Log

51	Cdrom	Warning	Error detected on the device \Device\CdRom0 during the paging operation.
	Upon OS installation		This event may be registered in the event viewer, but this does not affect system operation.

Windows Server 2008 R2

System Event Log

1	iScsiPrt	Error	Initiator failed to connect to the target. Target IP address and TCP Port number are given in dump data.
	When Windows Server 2008 R2 is operating while iSCSI is recognized		Go to the following Microsoft website for details. http://support.microsoft.com/kb/976072/en-us
4	b57nd60a	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
4	l2nd	Warning	Broadcom BCM57711 #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.

<table>
<tr><td rowspan="2">11</td><td>Disk</td><td>Error</td><td>The driver detected a controller error on Device\HarddiskX\DRX.

Note: A different number replaces X depending on the connection
status of the disk.</td></tr>
<tr><td colspan="2">Upon connecting with a USB device, remote media,
and/or Virtual Flash USB Device</td><td>When the below values are 00 in Details in the event logs → Display, this event does not affect system operation.

<Word style>
0000: 0068030E 00000001 00000000 C004000B
0008: 00000103 00000000 00000000 002D0800
0010: 00000000 00000000 000427B7 00000000
0018: FFFFFFFF 00000006 00000040 00000000
0020: 12060000 10000008 00000000 0000003C
0028: 00000000 86BAA280 00000000 86BDB008
0030: 00000000 00000000 00000000 00000000
0038: 00000000 00000000 00000000 00000000
0040: 00000000 00000000 00000000 00000000
0048: 00000000 00000000 00000000 00000000
0050: 00000000 00000000

<Byte style>
0000: 0E 03 68 00 01 00 00 00 ..h.....
0008: 00 00 00 00 0B 00 04 C0 ....A
0010: 03 01 00 00 00 00 00 00 ....
0018: 00 00 00 00 00 08 2D 00 ......-.
0020: 00 00 00 00 00 00 00 00 ....
0028: B7 27 04 00 00 00 00 00 • '.....
0030: FF FF FF FF 06 00 00 00 yyyy....
0038: 40 00 00 00 00 00 00 00 @.......
0040: 00 00 06 12 08 00 00 10 ....
0048: 00 00 00 00 3C 00 00 00 ....<...
0050: 00 00 00 00 80 A2 BA 86 ....?¢o?
0058: 00 00 00 00 08 B0 BD 86 .....°??
0060: 00 00 00 00 00 00 00 00 ....
0068: 00 00 00 00 00 00 00 00 ....
0070: 00 00 00 00 00 00 00 00 ....
0078: 00 00 00 00 00 00 00 00 ....
0080: 00 00 00 00 00 00 00 00 ....
0088: 00 00 00 00 00 00 00 00</td></tr>
<tr><td rowspan="2">15</td><td>ebdrv</td><td>Error</td><td>lm_sp.c 2450 (ECORE_SUCCESS != ecore_status): An assertion happened.
Please note provider of this module.</td></tr>
<tr><td colspan="2">Upon delete a team in BACS</td><td>This event does not affect system operation.</td></tr>
<tr><td rowspan="2">129</td><td>Megasr1</td><td>Warning</td><td>A Reset command is issued to device \Device\RaidPort0.</td></tr>
<tr><td colspan="2">During Consistency Check</td><td>This event does not affect system operation.</td></tr>
<tr><td rowspan="2">134</td><td>Microsoft-Windows-Time-Service</td><td>Warning</td><td>NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on''.
NtpClient will try again in 3473457 minutes and double the reattempt interval thereafter.
The error was: No such host is known. (0x80072AF9)</td></tr>
<tr><td colspan="2">Upon OS Installation</td><td>This event does not affect system operation.</td></tr>
<tr><td rowspan="2">1004</td><td>IPMIDRV</td><td>Warning</td><td>The IPMI device driver attempted to communicate with the IPMI BMC
device during normal operation.
However the communication failed due to a timeout.
You can increase the timeouts associated with the IPMI device driver.</td></tr>
<tr><td colspan="2">When you operate
Windows Server 2008 R2</td><td>The above event log may be recorded. Usually, however, IPMI command retry processing is performed, so there is no operation problem.</td></tr>
</table>

Application Event Log

1015	Microsoft-Windows-Security-SPP	Warning	Description: Detailed information of HRESULT Returned hr=0xC004F022, original hr=0x80049E00
	Upon OS Installation		Unless the application event is registered after license authentication, this event does not affect system operation.
1534	Microsoft-Windows-User Profiles Service	Warning	Profile notification of event Create for component {56EA1054-1959-467f-BE3B-A2A787C4B6EA} failed, error code is The revision level is unknown.
	Upon OS Installation		Unless the application event is registered after license authentication, this event does not affect system operation.
8193	VSS	Error	Volume Shadow Copy Service error: Unexpected error calling routine IOCTL_DISK_GET_DRIVE_LAYOUT_EX(\\?\mpio#disk&ven_nec &prod _istorage_2000&rev_2800#1&7f6ac24&0&303030303030303933 31303 030373537303032393 4#{ GUID }) - BuildLunInfoForDrive. hr = 0x80070013, This media is write-protected.
	When you import a transportable shadow-copy to another server that has a read-only volume while operating Windows Server 2008 R2:		Go to the following Microsoft website for details: http://support.microsoft.com/kb/2003016/en-us
12289	VSS	Error	Unexpected error DeviceIoControl(\\?\storage#volume#_??_mpio#disk&ven_n ec&prod_istorage_1000&rev_1000#1&7f6ac24&0&303030303 030303031303030303032383030304636#{ GUID}#00000000 00007 e00#{ GUID }-00000000000002B8, x00560000,0000000000000000,0,00000000004866D0,4096,[0]). hr = 0x80070013, This media is read-only volume.
	When you import a transportable shadow-copy to another server that has a read-only volume while operating Windows Server 2008 R2:		Go to the following Microsoft website for details: http://support.microsoft.com/kb/2003016/en-us
12289	VSS	Error	Volume shadow copy service error: unexpected error DeviceIoControl (\\?\fdc#generic_floppy_drive#6&6a032c4&0 &0 #{ GUID }-00000000000002B0,0x00560000, 0000000000000000,0,00000000001EC0E0,4096,[0]). hr = 0x80070001, function is incorrect.
	When you import a transportable shadow-copy to another server that has a floppy disk drive while operating Windows Server 2008 R2:		Go to the following Microsoft website for details: http://support.microsoft.com/kb/2003968/en-us

Applications and Services Logs

Microsoft-Windows-Kernel-EventTracing/Admin			
2	Microsoft-Windows-Kernel-EventTracing	Error	Session "" failed to start with the following error: 0xC000000D
	When running an OS for the first time		This event does not affect system operation.
3	Microsoft-Windows-Kernel-EventTracing	Error	Session "Microsoft-Windows-Setup" stopped due to the following error: 0xC000000D
	When running an OS for the first time		This event does not affect system operation.

Microsoft-Windows-Dhcp-Client/Admin			
1001	Microsoft-Windows-Dhcp-Client	Error	Your computer was not assigned an address from the network (by the DHCP Server) for the Network Card with network address 0x50E549A98325. The following error occurred: 0x79. Your computer will continue to try and obtain an address on its own from the network address (DHCP) server.
	When installing an OS, running an OS for the first time, or applying Starter Pack		If this event is logged when installing an OS, running an OS for the first time, or while applying Starter Pack, it does not affect system operation.

Windows Server 2008

System Event Log

4	• For Windows Server 2008 x64: b57nd60a • For Windows Server 2008 x32: b57nd60x	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
4	l2nd	Warning	Broadcom BCM57711 #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
5	Storflt	Warning	The Virtual Storage Filter Driver is disabled through the registry. It is inactive for all disk drives.
	Upon OS Installation		This event does not affect system operation.
10	VDS Dynamic Provider	Error	The provider failed while storing notifications from the driver. The Virtual Disk Service should be restarted. hr=80042505
	Upon OS Installation		Go to the following Microsoft website for details: http://support.microsoft.com/kb/948275/en-us
15	ebdrv	Error	lm_sp.c 2450 (ECORE_SUCCESS != ecore_status): An assertion happened. Please note provider of this module.
	Upon delete a team in BACS		This event does not affect system operation.
129	Megasr1	Warning	A Reset command is issued to device \Device\RaidPort0.
	During Consistency Check		This event does not affect system operation.
134	Microsoft-Windows-Time-Service	Warning	NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on 'time.windows.com,0x9'. NtpClient will try again in 15 minutes and double the reattempt interval thereafter. The error was: No such host is known. (0x80072AF9)
	Upon OS Installation		This event does not affect system operation.
263	PlugPlayManager	Warning	The service ShellHWDetection may not have unregistered for device event notifications before it was stopped.
	Upon OS Installation		This event does not affect system operation.

1004	IPMIDRV	Warning	The IPMI device driver attempted to communicate with the IPMI BMC device during normal operation. However the communication failed due to a timeout. You can increase the timeouts associated with the IPMI device driver.
	When the system is used.		The above event log may be recorded. Usually, however, IPMI command retry processing is performed, so there is no operation problem.
1021	Microsoft-Windows-Security-Licensing-SLC	Warning	SLUINotify service has failed to start. hr=0x80070424
	Upon OS Installation		Execute the license authentication from the license authentication screen.
1534	Microsoft-Windows-User Profiles Service	Warning	Profile notification of event Create for component {56EA1054-1959-467f-BE3B-A2A787C4B6EA} failed, error code is -2147023591
	Upon OS Installation		The event may be registered at logon. This event does not affect system operation.
2505	Server	Error	The server could not bind to the transport \Device\NetBT_Tcpip_{7A71FB4F-0E8F-4E19-9B14-A68452 59AAD6} because another computer on the network has the same name. The server could not start.
	Upon OS Installation		This does not affect system operation.
4307	NetBT	Error	Initialization failed because the transport refused to open initial addresses.
	Upon OS Installation		This event log does not affect system operation unless it occurs often.
7000	Service Control Manager	Error	The Parallel port driver service failed to start due to the following error: The service cannot be started, either because it is disabled or because it has no enabled devices associated with it.
	Upon OS Installation		This event does not affect system operation.
15016	Microsoft-Windows-HttpEvent	Error	Unable to initialize the security package Kerberos for server side authentication. The data field contains the error number.
	Upon OS Installation		This event does not affect system operation.

Application Event Log

63	Microsoft-Windows-WMI	Warning	A provider, Ncs2, has been registered in the Windows Management Instrumentation namespace Root\cimv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. A provider, IntelEthernetDiag, has been registered in the Windows Management Instrumentation namespace Root\CIMv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. A provider, WmiPerfClass, has been registered in the Windows Management Instrumentation namespace root\cimv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.
	Upon OS Installation		This event does not affect system operation.
1020	EvntAgnt	Error	processing registry parameters. Extension agent terminating.
	Upon OS Installation		This event does not affect system operation.

1054	Security-Licensing-SLC	Warning	Component error. hr=0x80049E00, [4, 3]
	Upon OS Installation		This event does not affect system operation.
1500	SNMP	Error	The SNMP Service encountered an error while accessing the registry key SYSTEM\CurrentControlSet\Services\SNMP\Parameters\PermittedManagers.
	Upon OS Installation		This event does not affect system operation.
2019	EvntAgnt	Error	SNMP Event Log Extension Agent did not initialize correctly.
	Upon OS Installation		This event does not affect system operation.
3001	EvntAgnt	Warning	Log file not positioned at end.
	Upon OS Installation		This event does not affect system operation.
3003	EvntAgnt	Warning	Error positioning to end of log file -- can't get oldest log record. Handle specified is 17891340. Return code from GetOldestEventLogRecord is 223.
	Upon OS Installation		This event does not affect system operation.
6000	Microsoft-Windows-Winlogon	Warning	The winlogon notification subscriber <GPClient> was unavailable to handle a notification event.
	Upon OS Installation		This event does not affect system operation.
6001	Microsoft-Windows-Winlogon	Warning	The winlogon notification subscriber <GPClient> failed a notification event.
	Upon OS Installation		This event does not affect system operation.

Windows Server 2003 R2 x64

System Event Log

4	b57nd	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
9	Megasr	Error	The device \Device\Scsi\MegaSR1 does not respond within a timeout period.
	During Consistency Check		This event does not affect system operation.
7011	Service Control Manager	Error	Timeout (30000 milliseconds) waiting for a transaction response from the Dfs service.
	Upon OS Installation		Unless this event is registered by restarting the system, there is no problem in operating the system.
10016	DCOM	Error	The application-specific permission settings do not grant Local Activation permission for the COM server application with CLSID {555F3418-D99E-4E51-800A-6E89CFD8B1D7} to the user {NTAUTHORITY\LOCAL SERVICE} SID {S-1-5-19}. This security permission can be modified using the component Services administrative tool.
	Upon OS Installation		This event does not affect system operation.

Application Event Log

63	WinMgmt	Warning	A provider, HiPerfCooker_v1, has been registered in the WMI namespace, Root¥WMI, to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. A provider, WMIProv, has been registered in the WMI namespace, Root¥WMI, to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.
	Upon OS Installation		This event does not affect system operation.
3009	LoadPerf	Error	Installing the performance counter strings for service C:\WINDOWS\syswow64\ipsecprf.ini (C:\WINDOWS\syswow64\ipsecprf.ini) failed. The first DWORD in the Data section contains the error code.
	Upon OS Installation		This event does not affect system operation.
5603	WinMgmt	Warning	A provider, Rsop Planning Mode Provider, has been registered in the WMI namespace, root\RSOP, but did not specify the HostingModel property. This provider will be run using the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. Ensure that provider has been reviewed for security behavior and update the HostingModel property of the provider registration to an account with the least privileges possible for the required functionality.
	Upon OS Installation		This event does not affect system operation.

Windows Server 2003 R2

System Event Log

4	b57w2k	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
9	Megasr	Error	The device \Device\Scsi\MegaSR1 does not respond within a timeout period.
	During Consistency Check		This event does not affect system operation.
1001	IPMIDRV	Error	The IPMI device driver attempted to determine if the system supported an IPMI BMC device. The driver attempted to detect the presence of the IPMIBMC by searching the SMBIOS for Type 38 record. But either no record was found or the record was not compatible with the version of the device driver. If a SMBIOS Type 38 record was detected, the Dump Data field of the event contains a binary representation of the record.
	When the server is in operation.		If you use "Hardware Management" which is provided by Windows Server 2003 R2, above-shown event log will be registered. For more details, refer to "Enabling Microsoft Windows Server 2003 R2 Hardware Management" on the following site. [NEC Express5800 Web Site] http://www.58support.nec.co.jp/global/download/W2K3_R2/index.html

Application Event Log

1003	EvntAgnt	Warning	TraceFileLevel parameter not located in registry:Default trace file used is %1.
	When the server is in operation.		This event does not affect system operation.
1015	EvntAgnt	Warning	TraceLevel parameter not located in registry:Default trace level used is 32.
	When the server is in operation.		This event does not affect system operation.
5603	WinMgmt	Warning	A provider, Rsop Planning Mode Provider, has been registered in the WMI namespace, root\RSOP, but did not specify the HostingModel property. This provider will be run using the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. Ensure that provider has been reviewed for security behavior and update the HostingModel property of the provider registration to an account with the least privileges possible for the required functionality.
	Upon OS Installation		This event does not affect system operation.

3. Accessing Data for Electric Power, Temperature, and Processor Utilization

This chapter describes how to access data related to input power consumption in watts, intake temperature, and all logical processor utilizations in the Express Server during usual operation in accordance with ENERGY STAR® Program Requirements.

3.1 Windows

The sample program below is verified to be run normally on Windows Server® 2008.

3.1.1 Power consumption

Execute the following commands to access power consumption readings on BMC (Baseboard Management Controller) via IPMI (Intelligent Platform Management Interface).

```
Network Function Code : 2Ch (Group Extension)
Command Code : 02h (Get Power Reading)
Request Data : 000001DCh
```

Below is the sample file created by using Visual Basic Script (e.g. Power.vbs).

```
' Start Script
Option Explicit

' Prepare for IPMI Driver
Dim osvc, oclass
Dim oinstance, oipmi
set osvc = getobject("winmgmts:root¥wmi")
set oclass = osvc.get("microsoft_ipmi")
for each oinstance in osvc.instancesof("microsoft_ipmi")
         set oipmi = oinstance
next

'Format the IPMI command request
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
oinparams.networkfunction = &h2C
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h02
oinparams.requestdata = arry(&hdc,&h01,&h00,&h00)
oinparams.requestdatasize = 4


'call the driver
Dim outparams
set outparams = oipmi.execmethod_("requestresponse",oinparams)

WScript.Echo " Completion Code = 0x" & hex(outparams.Completioncode)
If outparams.Completioncode <> 0 Then
   Wscript.Echo " Not supported"
Else
   'WScript.Echo " Data LS Byte   = 0x" & hex(outparams.ResponseData(2))
   'WScript.Echo " Data MS Byte   = 0x" & hex(outparams.ResponseData(3))
   WScript.Echo " Power Consumption = " & outparams.ResponseData(3)*256 + _
                                       outparams.ResponseData(2) & " watts"
End If
' End Script
```

- Execution example

```
C:¥VBS> cscript //nologo Power.vbs
```

- Execution result

```
Completion Code = 0x0
Power Consumption = 76 watts
```

The power consumption is 76 watts.

Tips

Power consumption readings may not be acquired depending on the power supply configuration of the server.
The completion code in such cases is `0xC1` or `0xCB`.

3.1.2 Intake air temperature

Execute the following standard commands that conform to IPMI to search the SDR (Sensor Data Record) for the temperature sensor and obtain intake air temperature data.

- `Get SDR Repository Info`
- `Reserve SDR Repository`
- `Get SDR`
- `Get Sensor Reading`

Below is the sample file created by using Visual Basic Script (e.g. Sensor.vbs),

```
'Start Script
Option Explicit

' Prepare for MS IPMI Driver
Dim osvc, oclass
Dim oinstance, oipmi
set osvc = getobject("winmgmts:root¥wmi")
set oclass = osvc.get("microsoft_ipmi")
for each oinstance in osvc.instancesof("microsoft_ipmi")
         set oipmi = oinstance
next

' (Get SDR Repository Info)
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
' (Get SDR Repository Info)
oinparams.networkfunction = &ha
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h20
oinparams.requestdatasize = 0
' Fire IPMI Command
Dim outparams
Dim i, RecordCount
set outparams = oipmi.execmethod_("requestresponse",oinparams)
RecordCount = outparams.ResponseData(3)*256 + outparams.ResponseData(2)

' (Reserve SDR Repository)
oinparams.networkfunction = &ha
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h22
oinparams.requestdatasize = 0
Dim Reserve_LS, Reserve_MS
set outparams = oipmi.execmethod_("requestresponse",oinparams)
Reserve_LS = outparams.ResponseData(1)
Reserve_MS = outparams.ResponseData(2)

' (Get SDR) for each record
Dim Record_LS,Record_MS, Offset, Length
Dim cnt, sensorNum, sensorType
' First Record
Record_LS = 0
Record_MS = 0
For cnt = 0 to RecordCount-1
   Offset = 0
   Length = 9
   oinparams.networkfunction = &ha
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h23
   oinparams.requestdata = array(Reserve_LS, Reserve_MS, Record_LS, Record_MS, Offset, Length)
   oinparams.requestdatasize = 6
   set outparams = oipmi.execmethod_("requestresponse",oinparams)
```

```
    If outparams.Completioncode = 0 Then
       If outparams.ResponseData(6) = 1 Then          ' Full Sensor Record
          call GetSensorType(Reserve_LS, Reserve_MS, Record_LS, Record_MS, sensorType)
          If sensorType = 1 Then                    ' Temperature
             WScript.Echo "========================================="
             call GetIDString(Reserve_LS, Reserve_MS, Record_LS, Record_MS)
             WScript.Echo " Sensor Type = Temperature"
             sensorNum = outparams.ResponseData(10)
             call GetSensor(Reserve_LS, Reserve_MS, Record_LS, Record_MS,sensorNum)
          End If
       End If
       Record_LS = outparams.ResponseData(1)
       Record_MS = outparams.ResponseData(2)
       If Record_LS = &hff And Record_MS = &hff Then
           exit For
       End If
    End If
Next

Sub GetSensorType(rv_ls, rv_ms, rc_ls, rc_ms, sensorType)
    Dim outtmp
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 12, 2)
    oinparams.requestdatasize = 6
    set outtmp = oipmi.execmethod_("requestresponse",oinparams)
    sensorType = outtmp.ResponseData(3)
End Sub

Sub GetSensor(rv_ls, rv_ms, rc_ls, rc_ms, sensorNum)
    Dim outtmp, units1, units2, sensortype
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 20, 14)
    oinparams.requestdatasize = 6
    set outtmp = oipmi.execmethod_("requestresponse",oinparams)

    units1 = outtmp.ResponseData(3)
    Select Case outtmp.ResponseData(4)
       case 0: units2 = "unspecified"
       case 1: units2 = "degrees C"
       case 6: units2 = "Watts"
       case else: units2 = "Refer to IPMI Specification: Type=0x" _
                           & hex(outtmp.ResponseData(4))
    End Select

    ' (Get Sendor Reading)
    Dim sensorData, rawData, currentValue
    oinparams.networkfunction = &h4
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h2d
    oinparams.requestdata = array(sensorNum)
    oinparams.requestdatasize = 1
    set sensorData = oipmi.execmethod_("requestresponse",oinparams)
    If sensorData.Completioncode <> 0 Then
       'WScript.Echo " Sensor Not Available"
       exit Sub
    End If
    rawData = sensorData.ResponseData(1)
    If units1 and &h40 Then
       If rawData And &h80 Then
          rawData = rawData Xor &hff
       End If
    Elseif units1 and &h80 Then
       call get2complement(rawData, rawData, 8)
    End If
    If (sensorData.ResponseData(2) And &h80) = 0 Or _
      (sensorData.ResponseData(2) And &h40) = 0 Or _
      (sensorData.ResponseData(2) And &h20) Then
       WScript.Echo " Event Status: Unavailable"
    Else
       'WScript.Echo " Event Status: ok"
       Dim M,B,k1,k2
       Dim ret
       M = (outtmp.ResponseData(8) And &hc0) * 4 + outtmp.ResponseData(7)
       B = (outtmp.ResponseData(10) And &hc0) * 4 + outtmp.ResponseData(9)
       call get2complement(M, M, 10)
       call get2complement(B, B, 10)
       call get2complement(outtmp.ResponseData(12) And &h0f, k1, 4)
       call get2complement((outtmp.ResponseData(12) And &hf0)/16, k2, 4)
       currentValue = CDbl (((M * rawData) + (B * (10 ^ k1))) * (10 ^ k2))
       WScript.Echo " Current Value = " & currentValue & " " & units2
    End If
End Sub
```

```
Sub get2complement(raw, rv, bit)
   Select Case bit
      case 4:
         If raw And &h8 Then
            rv = 0 - ((&h10 - raw) and &h0f)
         Else
            rv = raw
         End If
      case 8:
         If raw And &h80 Then
            rv = 0 - ((&h100 - raw) and &h0ff)
         Else
            rv = raw
         End If
      case 10:
         If raw And &h200 Then
            rv = 0 - ((&h400 - raw) and &h3ff)
         Else
            rv = raw
         End If
   End Select
End Sub

Sub GetIDString(rv_ls, rv_ms, rc_ls, rc_ms)
   Dim tmpMessage
   Dim outsdridstringtype
   oinparams.networkfunction = &ha
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h23
   oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 47, 1)
   oinparams.requestdatasize = 6
   set outsdridstringtype = oipmi.execmethod_("requestresponse",oinparams)

   Dim outsdridstring
   Dim idlength, j
   idlength = outsdridstringtype.ResponseData(3) and 31
   oinparams.networkfunction = &ha
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h23
   oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 48, idlength)
   oinparams.requestdatasize = 6
   set outsdridstring = oipmi.execmethod_("requestresponse",oinparams)
   tmpMessage = " ID String = "
   For j = 3 to idlength + 2
      tmpMessage = tmpMessage & Chr(outsdridstring.ResponseData(j))
   Next
   WScript.Echo tmpMessage
End Sub
'End Script
```

- Execution example

```
C:¥VBS> cscript //nologo Sensor.vbs
```

- Execution result

```
==========================================
 ID String = Baseboard Temp4
 Sensor Type = Temperature
 Current Value = 45 degrees C
==========================================
 ID String = Fnt Pnl Temp
 Sensor Type = Temperature
 Current Value = 27 degrees C
==========================================
 ID String = CPU1_DIMM1 Temp
 Sensor Type = Temperature
 Current Value = 35 degrees C
==========================================
 ID String = CPU1_DIMM2 Temp
 Sensor Type = Temperature
 Event Status: Unavailable
==========================================
```

Intake air temperature data is obtained from the sensor with an ID string that contains any of the following: `Amb`, `Ambient`, or `Front Panel`.

In the case of the sample above, the data is obtained from a sensor that contains `Fnt Pnl Temp` in its ID, with a resulting intake air temperature of 27°C.

3.1.3 Processor utilization

The utilization rate of all logical processors is given by executing the Win32_PerfFormattedData_PerfOS_Processor class that Windows OS provides. Below is the sample file created by using Visual Basic Script (such as Proc.vbs). This script outputs the processor utilization rate every 30 seconds.

```
' Start Script
strComputer = "."
Set objWMIService = GetObject("winmgmts:" _
   & "{impersonationLevel=impersonate}!¥¥" & strComputer & "¥root¥cimv2")
set objRefresher = CreateObject("WbemScripting.Swbemrefresher")
Set objProcessor = objRefresher.AddEnum _
   (objWMIService, "Win32_PerfFormattedData_PerfOS_Processor").objectSet
objRefresher.Refresh
Dim first
first = true
Do
  For each intProcessorUse in objProcessor
    If first Then
      If intProcessorUse.Name = "_Total" Then
        first = false
      End If
    else
      Wscript.Echo "Proc" & intProcessorUse.Name & " : " & _
                "PercentProcessorTime=" & _
                intProcessorUse.PercentProcessorTime
    End If
  Next
  Wscript.Sleep 30*1000   'sleep 30 * 1000ms
  objRefresher.Refresh
Loop
' End Script
```

- Execution example

```
C:¥VBS> cscript //nologo Proc.vbs
```

- Execution result

```
Proc0 : PercentProcessorTime=0
Proc1 : PercentProcessorTime=0
Proc2 : PercentProcessorTime=0
Proc3 : PercentProcessorTime=0
Proc4 : PercentProcessorTime=76
Proc5 : PercentProcessorTime=0
Proc6 : PercentProcessorTime=0
Proc7 : PercentProcessorTime=0
Proc_Total : PercentProcessorTime=9
```

`Proc 0` to `Proc 7` show the utilization rate of each processor while `Proc_Total` shows the total processor utilization rate.

3.2 Linux

The sample program below is verified to be run on Red Hat Enterprise Linux 5.

3.2.1 Power consumption

Power consumption is given by executing the following commands via IPMI to BMC.

```
Network Function Code : 2Ch (Group Extension )
Command Code : 02h (Get Power Reading)
Request Data : 000001DCh
```

The example below uses the open-source software OpenIPMI driver and IPMITool. For Red Hat Enterprise Linux 5, OpenIPMI is provided as an inbox driver. IPMITool is provided in: OpenIPMI-tools-[version].rpm

- Execution example

```
# ipmitool raw 0x2c 0x02 0xdc 0x01 0x00 0x00
```

- Execution result

```
dc 32 01 00 00 4d 01 7f 00 80 0e 33 4e 70 b2 72 01 40
```

Power consumption is given by calculating the 2-byte (16 bits) output value.

The second value 0x01 [15:8]

The first value 0x32 [7:0]

In the example above, power consumption = 0x0132 (hexadecimal) = 306 (decimal) watts.

Tips

Power consumption readings may not be acquired depending on the power supply configuration of the server.
In such cases, either of the following messages is displayed.

```
Unable to send RAW command (channel=0x0 netfn=0x3e lun=0x0 cmd=0xb rsp=0xc1): Invalid Command
```

3.2.2 Intake air temperature

Intake air temperature is given by executing `IPMI` commands to BMC.

The example below uses Open IPMI driver and IPMITool that are open source software. For Red Hat Enterprise Linux 5, OpenIPMI driver is contained in Inbox driver. IPMITool is contained in: OpenIPMI-tools-[version].rpm

- Execution example

```
# ipmitool sdr type Temperature
```

- Execution result

```
Baseboard Temp4  | 31h | ok  | 45 degrees C
Fnt Pnl Temp     | 35h | ok  | 27 degrees C
CPU1_DIMM1 Temp  | 40h | ok  | 48 degrees C
CPU1_DIMM2 Temp  | 41h | ok  | 46 degrees C
CPU1_DIMM3 Temp  | 42h | ok  | 49 degrees C
CPU1_DIMM4 Temp  | 43h | ns  | No Reading
CPU1_DIMM5 Temp  | 44h | ns  | No Reading
CPU1_DIMM6 Temp  | 45h | ns  | No Reading
P1 Therm Ctrl %  | A0h | ok  | 0 unspecified
```

The output above shows the following in a line in order.

1st: Sensor name
2nd: Sensor number
3rd: Sensor status
`ok` indicates that the status has not reached a point of warning or danger.
4th: Sensor monitoring point
5th: The current reading of the sensor

The sensor indicating intake air temperature contains `Amb`, `Ambient`, or `Fnt Pnl Temp` in its name.

The data in the above example is obtained from the sensor that contains `Fnt Pnl Temp` in its ID and the intake air temperature is 27°C.

3.2.3 Processor utilization

The utilization rate of all logical processors is given by executing the `mpstat` command provided in a Linux distribution.

For Red Hat Enterprise Linux 5, `sysstat-[version].rpm` contains the command.

- Execution example

```
# mpstat -P ALL
```

- Execution result

```
Linux 2.6.18-164.el5 (localhost.localdomain) 11/17/09

17:59:30     CPU   %user   %nice    %sys %iowait    %irq   %soft  %steal   %idle    intr/s
17:59:30     all    1.23    0.04    0.42    2.69    0.03    0.10    0.00   95.49   1086.42
17:59:30       0    0.42    0.00    0.58    0.76    0.00    0.00    0.00   98.24    666.34
17:59:30       1    0.41    0.00    0.29    1.09    0.00    0.00    0.00   98.21      0.00
17:59:30       2    2.17    0.00    0.33    2.30    0.00    0.00    0.00   95.21      0.00
17:59:30       3    1.85    0.08    0.68    8.55    0.00    0.60    0.00   88.24    379.87
17:59:30       4    0.87    0.00    0.19    0.42    0.00    0.00    0.00   98.53      0.00
17:59:30       5    2.42    0.01    0.35    1.31    0.08    0.00    0.00   95.83      6.63
17:59:30       6    0.30    0.01    0.17    1.39    0.00    0.00    0.00   98.13      0.02
17:59:30       7    1.36    0.20    0.74    5.72    0.12    0.20    0.00   91.66     33.54
```

You can acquire the processor utilization rate by subtracting `%idle` from 100%.